

MARINE RECORD

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AN OHIO RIVER TOW BOAT.

The news in the daily press regarding the high water on the Ohio River and the consequent danger to river craft, may have awakened in the minds of some of our readers some curiosity as to the type of boats in use on the Ohio. The coal trade is the principal freight commerce of this river, and through the courtesy of her master, Capt. E. A. Burnside, THE RECORD is enabled to show to its readers a picture of the most modern and valuable tow-boat on the Ohio River, the steamer E. R. Andrews.

The Andrews was built in 1894 at Howard's shipyard, Jeffersonville, Ind. Her over-all length is 192 feet, and the hull, exclusive of the wheel, is 165 feet long, by 32½ feet beam, her width, over guards, being 34½ feet. Her depth amidships is 5 feet, and her draft 4½ feet when light, and 5½ when fueled and stored.

The hull, excepting the bottom, which is composite, is built entirely of steel, including deck, cylinder frames, boiler deck, and boiler deck frames. The hog chains, which hold the hull together, performing the same service as the great arches on the older types of wooden lake steamers, are of the best charcoal iron, and the hog-chain braces are of large XX pipe. Her net tonnage is 351.07.

Power is obtained from two non-condensing engines of the Frisbie type, each 20 inches in diameter by 8 feet stroke. Her boilers are six in number, each being 3 feet in diameter by 28 feet in length, containing two 13-inch flues, all made of steel of 70,000 tensile strength, and allowed a steam pressure of 202 pounds. Her wheel is 23¼ feet in diameter, the blades being 30 inches wide by 22½ feet long. She makes about 16 turns per minute when bound down stream with her barges in tow, making 3½ miles per hour. Her speed up stream with empties in tow is 6 miles per hour, making 18 or 19 turns. Her average tow is 25 barges each way, the cargo of these aggregating about 550 tons. The speed of the boat in dead water is about 14 miles, when light. Her coal consumption is 45 tons of slack in 48 hours. Her chief engineer is Mr. Wm. Johnson.

The Andrews is licensed as a passenger boat and carries full passenger equipment. The cabins are handsomely furnished, and in addition the owners have a private cabin for their own use, which is elegantly furnished, and to which is attached a private lavatory, with bath and patent closets.

The crew consists of 31 men—the captain, who is also pilot, second pilot, two mates, two engineers and a striker, six firemen, twelve deck hands, striker pilot, and four in cabin crew.

The boat is lighted throughout with electricity, and has a Rushmore searchlight. She is equipped with a Cincinnati steam steerer, which is connected direct from the piston of the steerer to tiller beams connecting the three rudders. She has also a Link-Belt coal conveyor for use in taking her fuel aboard. The rest of her equipment is equally modern, no expense being spared to make her first-class in every respect.

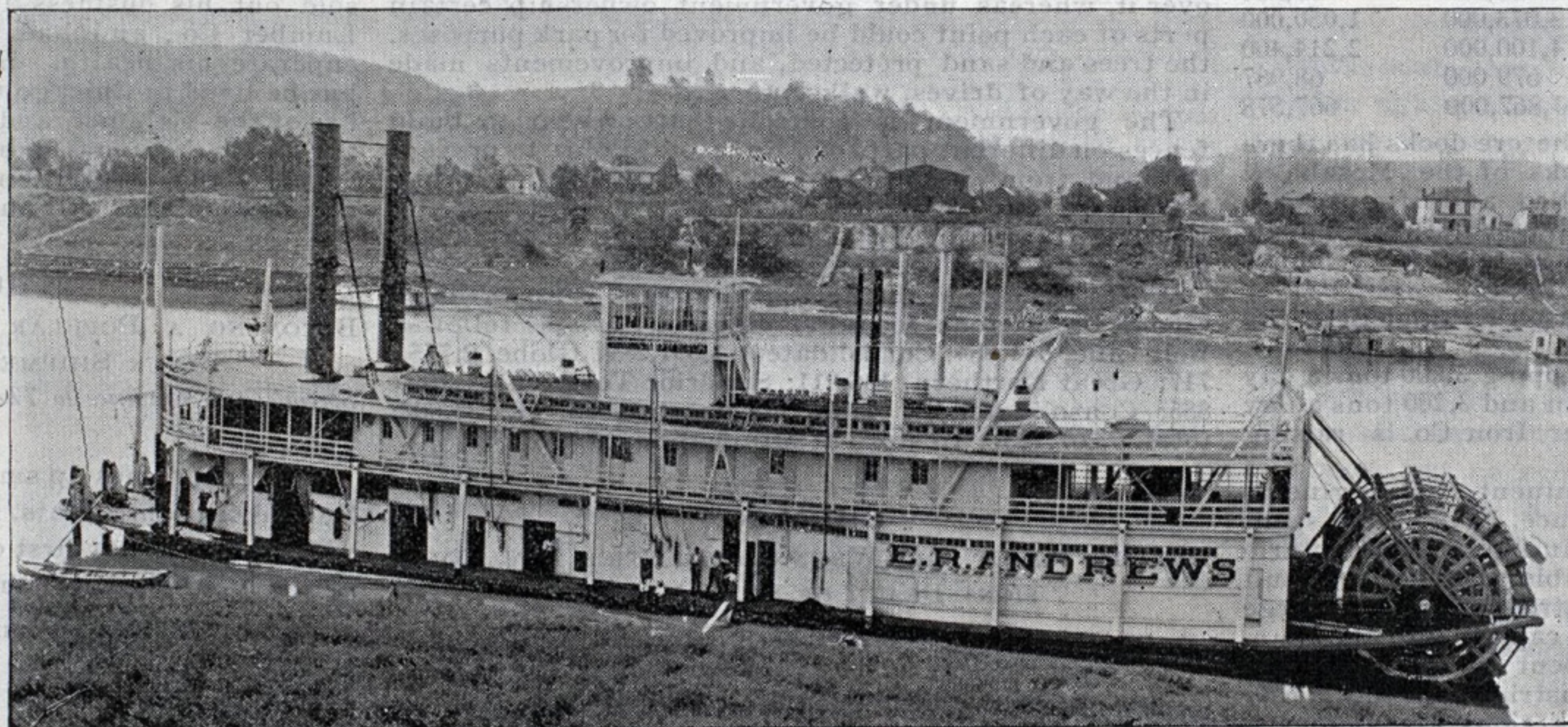
The specifications for her main and auxiliary engines,

hull, in part, and the designs and specifications for her cabins, upper works, deck-plans, piping, boilers and outfit in general were furnished by her present commander, Capt. Burnside, who also superintended her construction after the hull was launched. He states that he received many original ideas and valuable suggestions from Messrs. S. F. and J. E. Dana, of the Kanawha & Ohio Transportation Co., which is the owner of the boat. The hull construction was supervised by Capt. James Elliott, though due credit is given to the skill of the builders, and to Capt. Thomas Dunbar, their superintendent.

The steamer was named in honor of Mr. E. R. Andrews, of Rochester, N. Y., president of the Campbell's Creek Coal Co., of Malden, W. Va., and Cincinnati, of which company President S. F. Dana, of the Kanawha & Ohio Co., is vice president and manager. Her cost was about \$70,000.

TO OVERCOME HEELING ERROR.

Mr. Frank Morrison, the well-known compass manufacturer and adjuster, has completed a device for adjusting heeling error of compasses to a minimum. His system of fastening magnets to upright posts in the stand



OHIO RIVER TOW BOAT E. R. ANDREWS.

of the binnacle is well-known, and the new device is a modification of this. The posts, four in number, and arranged with reference to each other, as are the four cardinal points of the compass, are suspended rigidly from the compass bowl, and extend downwards some little distance into the binnacle, which is large enough to give them ample swing. The magnets are adjusted on these posts, and of course the distance between them and the needle always remains the same. This leaves nothing but the chain lockers to change relative positions, and Mr. Morrison is working on a scheme to overcome this.

NEW HYDROGRAPHIC CHART—CLEVELAND.

The Hydrographic Office has just issued a large, accurate and handsome chart of Cleveland's inner and outer harbor, and the adjacent portion of Lake Erie, containing the results of the very thorough survey made last season by the U. S. S. Michigan. The soundings are given up the Cuyahoga River as far as Jefferson street bridge, and up the old river bed to its head. The chart measures about 30 x 40 inches. Price \$1.25, at MARINE RECORD offices, Fourth Floor, Western Reserve Bldg.

NOTES.

The ram Katahdin, at the New York Navy Yard, will, it is thought, be detained there until October next, to undergo necessary alterations.

The paint shop at the yards of Messrs. Cramp & Sons, Philadelphia, Pa., was destroyed by fire on August 2, entailing a loss estimated at \$40,000. The structure was 200 by 90 feet. The steam launch of the Iowa narrowly escaped destruction.

John J. Hogan, of Middletown, N. Y., died Friday, aged 45 years. He was the inventor of the water tube boiler which bears his name. Mr. Hogan was just commencing to reap the reward of his ingenuity and enterprise, and the Hogan boiler was being extensively adopted for stationary purposes. Mr. Hogan was also a voluminous writer upon the subject of steam generators.

Mr. M. N. Forney, who is well known as a member of the editorial staff of the American Engineer, Car Builder and Railroad Journal, has recently opened an engineering office at No. 41 Cortlandt street, New York, and is prepared to furnish designs and specifications of all kinds of engineering devices and equipment. Mr. Forney is a member of the American Society of Mechanical Engineers and an associate member of the American Railway Master Mechanics, and the Master Car Builders' Associations.

The notice in the Official Gazette that the Ottawa Valley Canal Co. would apply for an extension of time to commence operations has drawn the public attention once more towards this great enterprise. Marcus Smith, C. E., is about to make a new survey, and will, it is said, run the line of the canal through the southern channel at Allumette Island, passing the town of Pembroke. Mr. Smith estimates the cost of the canal at fifteen millions. It is thought that the motor power developed by the construction of the canal would be sufficient to operate all the industries in Eastern Ontario, the Ottawa, Arnprior & Parry Sound Railway, and the C. P. R. from Quebec to Winnipeg. —Canadian Engineer.

The lumber shipments from Saginaw River ports in July were as follows: Bay City to Tonawanda, 4,200,000; Cleveland, 2,200,000; Toledo, 256,000; Buffalo, 580,000; Erie 825,000; Sandusky, 195,000; total 8,176,000. From Saginaw to Cleveland, 1,240,000; Sandusky, 400,000; Tonawanda, 1,255,000; total, 2,985,000.

NEWLY ENROLLED TONNAGE.

Following is a list of lake vessels to which official numbers and signal letters have been assigned by the Commissioner of Navigation, for the week ending August 1:

Official No.	Rig.	Name.	TONNAGE.		Where Built	Home Port
			Gross.	Net.		
107,236	St. s.	Appomattox	2,643.67	2,082.17	W. Bay City	Port Huron
155,288	St. s.	O C Steadman	68.09	37.25	Cleveland	Cleveland
161,773	Slp. y	Vencedor	18.08	15.13	Racine	Chicago
161,774	Slp. y	Vananna	19.48	17.45	Racine	Chicago

NEWS AROUND THE LAKES.

DULUTH.

SOME INTERESTING STATISTICS REGARDING THE CROP YEAR, WHICH ENDED AUGUST 1—ORE DOCKS BLOCKADED—COAL RATES AGAIN ADVANCED.

To the Editor of The Marine Record:

DULUTH, August 10.

The crop year for Duluth commences in September, as it is only during the last week in August that new wheat commences to arrive here. But inasmuch as Minneapolis computes the crop year from August 1 to August 1, a statement of the comparative growth of the two markets during the same period of time would not be out of place. During the twelve months ending August 1, Duluth received of wheat 64,191,000 bushels and Minneapolis 79,000,000 bushels as compared with 33,702,000 bushels and 51,317,000 bushels respectively for the 1894 preceding crop, showing an increase in the movement to Duluth of 88.25 per cent as compared with an increase at Minneapolis of 54.02.

In coarse grains, however, the increase has been something remarkable. The total bushels of all coarse grains was 14,058,000 bushels as compared with 4,044,000 during the twelve months of 1894-5, an increase of nearly 350 per cent, and in one of these grains the increase was 1,500 per cent, while in flax the increase was 800 per cent.

Barley and oats brought down the general average, the increase of the former being only 200 per cent and the latter 300 per cent. The total figures are given below.

The total receipts and shipments of grain to and from Duluth, for year ending August, 1896, with a comparison for the preceding year, are as follows:

	RECEIPTS.	1896	1895
Wheat	64,029,000	34,160,000	
Corn	904,300	20,266	
Oats	3,345,000	1,107,000	
Barley	2,291,000	2,168,000	
Rye	914,000	65,000	
Flax	5,308,000	685,400	
	SHIPMENTS.		
Wheat	49,225,000	23,844,000	
Corn	182,000	20,268	
Oats	3,073,000	1,050,000	
Barley	4,100,000	2,214,400	
Rye	679,000	68,987	
Flax	3,867,000	667,578	

Never before in the history of the ore docks has there been such a blockade. The docks of the Mesaba & Northern road at Duluth are filled and fifty cars are standing on the track waiting to be emptied. This is due to the poor market, which has fallen away below expectations.

The estimate on the whole season's shipment of ore from Two Harbors is 2,150,000 tons.

The Minnesota Iron Co. is shipping 3,600 tons a day from its hard ore mines at Soudan and 3,200 tons a day from the Chandler. The Pioneer Iron Co. is raising and shipping 2,200 tons a day.

Messrs. Bruill and Blum, two eminent civil engineers and mining experts of Paris, France, have lately spent some time in looking over the Minnesota and Ontario mineral districts, and their favorable verdict may result within a few months in the introduction of a large quantity of French and English capital into the country tributary to Duluth. They spent four weeks looking over the Port Arthur silver district and the Rainy Lake gold fields. Their investigations are conducted in the interest of a large and wealthy French and English syndicate and with a view to extensive investments, if their decision is favorable. They went over the mineral regions very closely, and they return home with a favorable impression as to these localities, and there is little doubt that they will use a large amount of capital in active development work. They were well pleased with the Rainy Lake gold deposits.

Capt. C. S. Barker has been awarded the contract for the improvement of Portage canal. Three parties had entered bids for the work. The bid of Capt. Barker was 11c for dredging soft material and 15c for hardpan. The amount of stuff to be removed under the contract consists of 240,000 cubic yards of soft and 40,000 yards of hardpan. For this he will receive \$28,000.

On September 1, the coal rate from Duluth to St. Paul will be advanced to \$1 per ton. It is now 75c, the point to which it was reduced to meet the Chicago competition. The differential which the Duluth lines have always claimed is 75c. This rate reduces it to 62½c. The Chicago lines demanded a lower differential, but this was settled upon as a compromise. The coal companies here claim that rates are so unsettled that they do not know just where they are at any time, and that therefore business is greatly retarded.

The strike of the flour handlers came to an end on the 1st inst., a compromise being effected at the rate of \$1.75 per day and 25c per hour for work. The hour men gain 5c more per hour.

Secretary Wilson, of the Head of the Lake Millers' Association, has returned from a trip to New York and Buffalo, where he has been in the interests of the flour trade with reference to the shipment of flour to the sea-

board. Mr. Wilson says that in the future there will doubtless be a great deal more flour shipped by the lake and rail route to the seaboard, as there are several advantages in its favor. In the first place, the canal route is cheaper, and, in the second place, there is a certainty of dispatch at the seaboard for foreign shipments. The railroads may hold the flour after it is received at the seaboard from thirty to sixty days, while canal boats deliver it to the vessel almost immediately. Mr. Wilson was much impressed with the extent of the canal traffic, and says when the proposed depth of nine feet is obtained the canal will be a great factor in the transportation question.

The long debated question of forcing Minnesota inspection out of Superior and substituting therefor a system of inspecting and weighing by and under the auspices of the Superior Board of Trade is finally settled, and probably the Minnesota inspectors will withdraw from Superior on August 12. Hereafter all grain wishing Minnesota inspection must be billed Duluth, or extra charges for transferring will be incurred.

It is quite likely that during the next session of Congress a bill will be introduced by Congressman Jenkins, of the Superior district, or by Congressman Towne, of Duluth, providing for the purchase by the government of the strips of land known as Minnesota and Wisconsin Points. Major Quinn, formerly government engineer at Duluth, was one of the first to propose the purchase, and Major Clinton B. Sears, the present engineer, is said to be favorable to it. The plan is to have the government appoint a commission to acquire every parcel of land on the two points by purchase, and to set aside certain portions of it for park purposes, the cities of Superior and Duluth to have control of and maintain the same under certain restrictions.

It is contended that the government should own the two peninsulas for the protection of the harbor; that it is absolutely necessary to take some action looking to the preservation of the land in order to prevent it from being washed away and the natural harbors thus left unprotected. The general use of the grounds for camping purposes has already had the effect of killing off many of the trees, and of wearing away the grass and shrubbery. If this continues for many years longer the land will be practically barren and the winds will have full play upon the light sand, with the result that it will be gradually washed into the lake or the bay, and in time the long, narrow strips reduced to sand bars.

At present the land is owned by various individuals and corporations, and there is practically no control over it, whereas under government ownership certain parts of each point could be improved for park purposes, the trees and sand protected, and improvements made in the way of drives, walks, etc.

The government is compelled at present to build fences on different parts of Minnesota Point to prevent the sand from washing into the bay and in time it may be necessary to completely surround both stretches with fences. It is claimed that the lands could be purchased at present for comparatively small sums.

Wheat in store at the head of the lakes is apportioned among the various terminal elevator lines as follows: Belt Line, 641,884; Consolidated, 1,391,289; Globe, 2,775,717; Great Northern, 136,911; Superior Terminal, 1,169,855; Consolidated B, 118,465; Consolidated H, 33,002; total, 6,267,123. In store at Minneapolis, 13,887,558.

CHICAGO.

DETAILS ABOUT THE WRENN-APPRENTICE BOY COLLISION—DEATH OF S. K. MARTIN.

OFFICE OF THE MARINE RECORD, }
CHICAGO, August 12. }

The steel steamer Coralia left South Chicago on Saturday night loaded with 186,130 bushels of corn on a draft of 16 feet of water.

On Wednesday night of last week the Goodrich Co.'s new steamer Iowa, when going out of Chicago bound for Grand Haven and Muskegon on her initial trip, collided with and sunk the fine schooner yacht Hawthorne, about one-quarter of a mile southeast of the light-house at the end of the government breakwater. The yacht went down in 50 feet of water. The captain and four men, comprising the crew of the Hawthorne, were rescued by the Iowa and were sent ashore on a tug which was signaled for after the collision. The Iowa was not damaged. She had on board about 250 passengers and proceeded on her trip.

The Dunham Towing and Wrecking Co. are engaged in raising the Hawthorne under the superintendence of Wrecking Master Cyrus St. Clair. Her masts and gear were a menace to navigation, and they have been taken out of her. The Hawthorne was one of the finest and fastest schooner yachts of the Chicago fleet. She was built by E. W. Heath, at Benton Harbor, and valued at \$10,000.

The whaleback passenger steamer Christopher Columbus did not run on her usual daily trip to Milwaukee on Tuesday. She remained in port and received a new blade to her wheel. All the passenger steamers out of Chicago have been crowded with excursionists who have been only too glad to get out into Lake Michigan and escape from the almost unendurable heat in the city during the past ten days.

The schooners George L. Wrenn and Apprentice Boy arrived at this port Sunday morning at 11 o'clock, in tow of the tug Welcome. The schooners had been in

collision a few miles off shore between Milwaukee and Port Washington. The bowsprit and head gear of the Apprentice Boy was carried away and she was leaking badly. The Wrenn was but slightly damaged. The collision occurred at 6 o'clock Saturday morning in a fog. The schooners were half a dozen lengths apart when they sighted each other. The Apprentice Boy struck the Wrenn on the starboard side, but the Wrenn's deck load of lumber saved her from serious damage. The Apprentice Boy's bowsprit broke off close to her stem and her stem was also damaged by the force of the blow, and the loss of her bowsprit and head gear rendered her almost helpless. The vessels drifted apart after the collision and the Wrenn proceeded on her course for Chicago. About three hours later she met the tug Welcome, of the I. T. Line and Capt. Shaner informed the captain of the tug of the accident. The Welcome started immediately in search of the disabled schooner, and six hours after the collision found her and took her tow-line. The Wrenn was afterwards overtaken and both were brought into port. Captain John Peel, of the Apprentice Boy, states as follows: Southeast by east, running out from the land on the starboard tack, wind about the south, we sighted the Wrenn on the port tack, heading southwest. As we were on the starboard tack we had the right of way. I held on my course, thinking the Wrenn would give me a clear way, but when it was too late I found that she was holding her course also.

Uncle Dick Davis sold his excursion steamer Claribel last week to Fritz Jahneke, of New Orleans, for \$5,000. The Claribel will be taken down to New Orleans.

The steel steamer Queen City left South Chicago last Thursday night with a cargo of 5,754 tons of corn. She drew 16 feet 3 inches forward and 16 feet 10½ inches aft.

Samuel K. Martin, the Chicago lumberman, died at Alma, Mich., at 4 o'clock Tuesday morning from Bright's disease. Mr. Martin, who was 59 years old at the time of his death and lived, when in Chicago, at 2600 Michigan avenue, was for many years president of the S. C. Martin Lumber Co., the largest lumber concern in the world, which he had built up from a foundation of one man and a single team of horses. Beginning his local business career in 1860, Mr. Martin finally became owner of fifty lumber yards, located in a dozen different states, with a fortune estimated at \$7,000,000. He was the builder of the old exposition building on the lake front and filled many other gigantic contracts with satisfaction to all concerned.

Last March, finding his health failing, Mr. Martin sold out his business interests to the Edward Hines Lumber Co., and had since been endeavoring to recuperate his health. He was a New Yorker by birth, but he lived in Chicago thirty-six years and was a member of the Calumet and other clubs and a director of the Union National Bank. Mrs. Martin and five children—Elmer B., Wilton B., S. K. Martin, Jr., Walter and Marion survive him.

WILLIAMS.

BUFFALO.

BECOMING A POPULAR RESORT FOR LAME DUCKS—
FLOUR SHIPMENTS BY CANAL ROUTE.

Special Correspondence to The Marine Record.

BUFFALO, August 11.

This port comes up smiling still in spite of the hard lines in coal shipments, for the grain is still pouring in, with only the very first of the new Chicago fleet here yet. But for the spurt there Buffalo would have suffered with the rest, though lumber is doing fairly well, and strange to say, there is a better showing in ore than formerly, as the docks are not loaded down as others on Lake Erie are.

This appears to be the special haven for crippled boats just now. There are more of them here now than before in a long time. The schooner St. Lawrence is fixing up the ruined jibboom and head gear from the unexplained collision on Lake Erie some weeks ago. The steamer Samoa will be out of dock in a week or so. The striking in St. Lawrence River will cost her \$6,000 to \$7,000. The big liner North West is here putting her water-tube boilers into shape. She will get away on her regular time Friday evening, having lost a trip. The little Canadian schooner M. L. Breck was caught in the squall of Monday night and driven on the beach opposite the foot of Main street. She was released next day without sustaining any special injury, but after a hard tussle on the part of the tugs, as she was four feet out and the tugs drew much more water than was about her. The Toledo liner Gault, which struck last week in coming out of that port, is still here. It is found that the breach is only a small hole in a single plank, made by a sharp stone or an anchor. The figures on the survey of the St. Louis, which was smashed badly by the G. F. Williams, are not in yet, but she is pretty well used up. The Ed. Smith No. 1, which lost her stem in the squall, has been partly unloaded of her coal cargo, and will be fixed up in a short time. Next!

There will be something to talk about when the two great yachts Say When and Enquirer try titles at the Cleveland regatta. The Enquirer is gaining all sorts of good opinions from lake men who have sailed in her, and she is experimenting in wheels too, so that she can do herself justice when the time comes. The two look a good deal alike, but if the Ohio boat gets up the speed

that the Buffalo one does, it will do more than is looked for here.

Capt. George McLeod is back from a three weeks' trip to his old home in Prince Edward Island. He says that the boat from Boston to Halifax and thence on to the island is not to be beaten for accommodation or attention to passengers. He missed a few choice wrecking jobs while he was away, but will get enough of them now before the season is over, and he knows how to take care of them with the best of them.

There was a sight in front of his dock last Friday that made Agent Fisher, of the Cleveland & Buffalo line look both pleased and sorry. The City of Buffalo came up to the dock after being delayed nearly all day by the monster excursion from Ohio, so loaded with people from main deck to pilot house that it reminded a person of a swarm of ants on a sugar cask. "If I only had a camera," moaned the agent, "what a picture it would make!" "And what an 'ad' for the line, too," added his acquaintances who had come down to look at the sight, "you have missed the chance of your life."

It is too bad that the big passenger liner North West must lose a trip right in the cream of the season. The company did a remarkably graceful thing in taking care of the passengers in whatever way they desired. Some were sent forward to destination, some waited in Detroit at the company's expense and some came back to Buffalo on the boat, to wait till the North Land sails on Tuesday night.

It's a trifle queer that there is not a boat laid up here yet, unless it be the smallest Lehigh liner, for all the expectation that there would be half the lake fleet idle by this time. If every wild boat in the list should go out of business the 90 liners would keep this harbor fairly busy, especially with all the crowd of excursion boats to huddle in about the foot of Main street.

There is going to be flour carried by the new lake and canal route hereafter. The canal took out 17,451 barrels last month, and, strange to say, the report is that the transfer to ocean steamer in New York is a decided improvement over the rail delivery. Then the route is cheaper than lake-and-rail besides.

Lake receipts for the last week were as follows: Wheat, 602,000 bushels; corn, 1,645,654 bushels; oats, 1,015,478 bushels; barley, 177,000 bushels; rye, 95,000 bushels; flaxseed, 112,000 bushels; flour, 292,752 barrel; copper, 5,085 tons; pig iron, 2,078 tons; iron ore, 22,313 tons; lumber, 12,723,223 feet; shingles, 3,050,000. Shipments were: Coal, 50,925 tons; cement, 24,656 barrels; salt, 11,790 barrels; sugar, 42,132 barrels.

People who frequent the docks are much taken with the tricks of a "Rube," as they call him, who plays the fool for pay on one of the excursion line's boats. He would have been the king's jester in the days when such service was common, but in these cheap times he has to make faces and strike whimsical attitudes on a steamboat's paddle box. If the stories of the money he gets are half true he can be proud of the talent that comes so near to making a monkey of him.

CHAMBERLIN.

DETROIT.

SEVERAL LIVES LOST IN THE VIOLENT WIND STORM—EXCESSIVELY HOT WEATHER KEEPS WOODEN BOATS IN COMMISSION.

Special Correspondence to The Marine Record.

DETROIT, August 11.

Detroit has been visited by several violent storms during the past week, and several people have been drowned. During the storm of Sunday evening several yachts were overturned, resulting in five drownings and several narrow escapes. Capt. William Fisher, of the tug Arthur Jones, saved five men from one yacht, and picked up another yacht without any crew. It was one of the worst storms ever seen on the river. It blew many chairs overboard from the ferry steamer Fortune, blew one of their lifeboats from the davits, and nearly blew her passengers off. Capt. Lockeridge, of the Idlewild, said it blew and drowned out his signal lights, and put out all but three of the Grosse Point range lights.

The casualties included the capsizing of the yacht Corsair. All on board succeeded in climbing up on the overturned boat with the exception of Frank Hughes, who was drowned. William J. Thieme was drowned while bathing from the yacht Alberta. John Helke, Jr., was drowned while bathing near Pecke Isle. He was one of a party on the steam yacht Alma.

Were it not for the excessively hot weather, say some vessel men here, they would put their boat in ordinary at once. Incidentally it may be remarked that vessel men are here about universally in favor of some adequate system of combination, could it be effected.

From indications it is thought that Capt. Perkins will have no trouble in organizing a harbor of Ship Masters and Pilots here this fall, and getting a good membership.

C. W. Norton is doing a little chartering, but there is not yet enough demand to make business at all brisk. The Mongaun, owned by the Hurleys, and chartered to Cape Vincent at 3 1/2 c, is reported from Port Dalhousie to be leaking badly.

John Stevenson, agent for the Thompson Line, reports that they received their first consignment of peas from the Lake Huron shore on Monday. This line an-

nually brings down some 50,000 bushels of peas for D. M. Ferry and other seed men.

C. A. Chamberlin is keeping fairly busy, but says that loads are so scarce that it is very hard to keep charters filled.

John Walsh, manager for J. & T. Hurley, reports their business very dull, though their varied interests outside of vessel lines makes it possible for them to do something all the time.

The Killarney Fish Co. have had a phenomenal run of fish on Lake Huron and can scarcely take care of all that come. Then, too, the season is a very poor one for selling fish, and the company is obliged to store many thousand dollars' worth that would otherwise be sold and disposed of.

Secretary Kay, of S. F. Hodge & Co., says that the dull times are affecting their business in that many boats which are laid up on Lake Erie do their repairing there, and they lose the passing calls. Nevertheless, they are fairly busy, and are building some order work. They have added a lubricator department, under charge of a competent man, and vessel owners may do well to examine what they have to offer. Of course the firm will bid especially for marine lubricator and oiler work, and their long acquaintance with the marine trade should give them immediate favor.

The sad death of Mr. Edward Hinkle, of this city, by the accident to his yacht Azalea, at Port Huron, Sunday, is the cause of general sorrow among his many friends here. When the Normandie struck the yacht Mr. Hinkle was knocked over board, and was caught and crushed between the yacht and the dock. The agonizing scene was witnessed by his wife, who is still prostrated over the affair.

Grant Grummond says their passenger business on the State of Michigan is very good. They have had full loads for four or five trips, but their freight trade is slow. The Swain has still a month or six weeks' contract raft towing to do.

McC.

CLEVELAND.

YACHT RACES EXCITING GREAT INTEREST THIS WEEK—THOMAS QUAYLE SERIOUSLY ILL.

CLEVELAND, August 12.

The yacht races have been absorbing the interest this week. The grand review of Monday terminated rather disastrously, owing to the severe squall, but luckily, without fatal results. Perhaps luck is not the right term, for the utmost vigilance on the part of the life-saving crew and the captains of several tugs prevented the loss of life. The Canada carried off the honors Wednesday, in the 46-foot class, the Vivia in the 40-foot class, and the Sybil in the 25-foot class. The steam yachts Enquirer and Say When will try conclusions Thursday in a 30-mile race from Fairport to Cleveland.

Mr. Anthony Malone, secretary and general financial man of the Calvin Co., extensive lumber dealers and vessel owners, of Garden Island, Ont., is in the city this week in connection with some work to be done on the steamer Bothnia (Br.) by the Globe Iron Works Co. The boat is to receive steel arches and some other work. Incidentally, Mr. Malone is looking after some details regarding a contemplated rebuild of the machinery of the steamer Calvin (Br.).

There has been considerable complaint of late about heavy logs and possibly worse obstructions in the upper main river. The Devereux and Fedora both damaged shoes and wheels while coming down the river. The matter needs immediate attention.

The American Steel Barge Co. entered suit in the United States District Court, at Cleveland, against the owners of the steamer Philip Minch. The libellant is the owner of the whaleback barge 104, which April 24 was en route with coal from Ashtabula to Superior. While in Detroit River the barge was in tow of the steamer A. D. Thomson and at 5 p. m., in broad daylight, the Minch collided with her, striking her amidships on the starboard side. The claim is made that the collision was entirely due to the carelessness of the crew aboard the Minch. The damages and loss to the boat, the libellant claim, is \$6,741.30.

Mr. Thomas Quayle, the well-known veteran ship-builder, is critically ill at his home in the East End, and his friends are greatly concerned over his condition. His illness is an attack of Bright's disease. Mr. Quayle has not been well for some time, and experienced a short but dangerous illness last winter in Florida.

Mrs. Helen D. Bradley, widow of the late Alva Bradley, and mother of Mr. M. A. Bradley, died last Thursday evening at the family home on Euclid avenue.

Standard oil barge No. 75, came in from Lake Superior Tuesday, in tow of the steamer Gladstone. It was reported that she would engage in the oil transportation business on Lake Erie, but she is believed to be going to the Atlantic coast, whither she has been destined for some time. She will first make one or two trips between Cleveland and Buffalo.

We are just in receipt of first copies of a new Hydrographic Office chart of the St. Mary's River, covering the distance between Shifting Point, at the head of Little Mud Lake, and the Turning Buoy, in Mud Lake proper, with a part of the Winter Point Range. The price of this chart is only 25c, although made from the latest surveys. For sale at MARINE RECORD offices, Fourth Floor, Western Reserve Building.

THE SAULT PASSAGE RULES.

The fining of thirty or more vessels under the new rules for the regulation of navigation through narrow passages in the St. Mary's River has resulted in a more thorough study of the rules by the masters, who are always informing themselves regarding the distances between points specified in the rules. In order to satisfy desire for knowledge in this respect, Capt. W. S. Mack has measured the distances on the chart and has made out tables something as follows:

ABOVE LOCKS.

Big Point to upper end of canal 10,100 ft. or piers 2 miles, 18 min.

BELOW LOCKS.

Government pier to float light at head of Hay Lake 6 3/4 miles 54 min.

(Here follows navigation through Hay Lake, not covered by rules, of 5 miles.)

South end of Hay Lake to can buoy above the dyke 2 1/2 miles
Can buoy to Harwood's Point 3 1/4 miles
Harwood's Point through Little Mud Lake to turning buoy at Point of Woods 3 1/4 miles
Point of Woods turning buoy to turning buoy No. 7 above Encampment 1 mile
Encampment Buoy No. 7 to Mud Lake turning buoy 4 miles 630 ft. 14 miles 2 hours

The matter of current has been urged a good deal by the few complainants against these rules, but Capt. Mack points out that the only two places where any current worth mentioning exists are 4,125 feet of the Hay Lake Channel, where the cut is through the islands, and 6,750 feet along the dyke, the total distance being a little more than two miles. He has written to Col. G. J. Lydecker for information as to the exact speed of the current at these places, but states that it is not so considerable as to be considered dangerous.

FREIGHT CONDITIONS.

While boats that have been idle are going into commission again, still others are laying up, and there is no doubt that the total number of boats in ordinary is considerably in excess of what it was a week ago. Cargoes are in moderate supply at Chicago, but if too many of the largest class ships go there the rates will be demoralized. Corn is now paying 1 1/4 cents to Buffalo. At Buffalo hard coal still pays 20 cents to all ports, but the Ohio soft coal rate has dropped from 25 cents to 20 cents. There is a little inquiry at Duluth for vessel room for wheat at 1 1/2 cents to Buffalo, and 3 1/4 cents to Kingston, but no general movement from the head of the lakes can be expected for two weeks yet. Ore has ceased to be a factor in the market.

BREAKWATER AT CAPE VINCENT.

The \$25,000 appropriation allowed for the improvement of the harbor at Cape Vincent will be largely expended in beginning the construction of a breakwater there. Mr. William Pierson Judson has been surveying the harbor bottom, and making a close study into the natural conditions which exist, in order that the best location may be selected for the purpose. Mr. Judson finds that the bed-rock is found 14 and 15 feet beneath the blue clay which forms the bottom. The clay is very soft, and the proposed structure must be sunk through it to the rock, which is, on an average, about 35 feet below the water level. The present appropriation will serve to construct only about 125 feet of this breakwater, but this will prove a very respectable beginning.

BOAT BUILDER ASSIGNS.

M. R. Davis, doing business in his own name and also under the firm name of Davis & Son, boat builders, Kingston, Ont., assigned last month to Robert J. McKelvey, of Kingston. Mr. Davis has the sympathy of his creditors in his difficulty, and a compromise at 40 per cent has been arranged, time being given for payment. The principal creditors are: Thomas Myles & Son, \$391; McKelvey & Birch, \$500; Kingston Foundry, \$281; S. Anglin & Co., \$248; Canada Locomotive and Engine Co., \$2,000; Booth & Co., \$141; Rathbun Co., \$234; Ontario Bank, \$100; W. Mitchell, \$100; Chas. D. Durkee, \$100; preferred claims, \$1,278. There are some thirty odd creditors of amounts under \$100, the total liabilities being about \$4,850, with assets valued at \$2,800.

IN THE ENGINE ROOM.

PROPORTIONS AND EFFICIENCY OF PROPELLER WHEELS.

BY CAPT. H. C. PEARSONS.

When we see among the magnificent vessels on the lakes two large vessels of similar proportions and of about the same displacement, making what we call good time, without material difference in their speed, though one of them has less than 40 per cent of the power of the other, we are led instinctively to ask the cause of so much difference in the cost and power of the proportion when there is so little difference in the results.

Again, we hear from those reported to be good engineers such expressions as the following:

"A wheel is of little account that does not show a liberal slip." "Some wheels run too near to the pitch."

Such expressions would indicate that "slip" was at a premium. In such a case why not use a farmer's post auger for a propeller wheel? It would afford all the slip desired, and at far less expense than the modern wheel. Moreover, it would be less exposed to injury.

Such conditions and remarks show a lamentable lack of system or method, or knowledge of, fundamental principles concerning the propeller wheel. It is rare that any two engineers, high in the confidence of ship-owners, will design machinery to fit out a vessel for any given purpose that will give the same results, or even approximately the same results.

There is no doubt but this diversity of results comes from the want of a knowledge of one or two of the principal factors that enter into the problem.

It does not appear that the idea that a certain amount of water per unit of power, must be acted on by the wheel in order to afford the engine sufficient inertia to work upon has yet found its way into the minds of more than a few engineers, or we would not see such diversity of size of wheels for working off the same amount of power that our lake marine affords.

And there is another important factor that, so far as I know, has not been brought to use, nor even mooted by engineers, and that is the pitch angle at the center of effort of the blade of the wheel.

It is this angle that determines the portion or per cent of the total work delivered to the wheel that is available for propulsion. And it seems to have escaped the notice of engineers that, this angle being known, the efficiency of the wheel becomes determined at once and readily found.

□ This is of the first importance in designing the motive plant for a steamship, as the place of the shaft cannot be known till the diameter of wheel is known, and this diameter must be known from its own efficiency, and the amount of power to be employed. But this pitch angle cannot be known till its place or distance from the center of wheel is known, because the angle of pitch varies from the end of the blade, where it is minimum, to the center, where it is a right angle.

In "King's Notes on Steam" we are informed that this center of effort is at the circumference of a circle having one half the area of a circle whose diameter is that of the wheel, or the square root of $\frac{1}{2}$ = about 70 per cent of the radius from center of wheel. This would be the case only for the motion of wheel, which quickly removes this question from the realm of statics to that of dynamics, where the conditions are very different. For the present we will merely say that this point is at 90 per cent of radius of wheel from the center, not 70 per cent. It would be foreign to the object of this paper to give the analysis from which the formula was derived for finding this point—but I give the formula. The distance from center of wheel to center of effort equals

$$\sqrt{\frac{5}{3}} \text{ plus } 3\% R = 90\% R$$

where R represents length of blade measured from center of wheel.

The method of finding the minimum volume of water to be acted on by the wheel per I. H. P. to afford the

requisite amount of inertia for engine to work upon, is that of observation—simple and pure.

In this discussion the helix of the wheel face is supposed to be that of the true screw, the most efficient of all the multitudinous forms known. And it will be observed, too, that a unit of disc area in one wheel may have a very different holding power from that of the same unit in another wheel, which may have a different weight of water on it, thus: A ten-foot wheel will afford twice as much inertia per unit of disc area as a five-foot wheel, for the reason that there is twice as much weight of water over its center of effort.

We will show the use of these two factors in the designing of the propeller wheel:

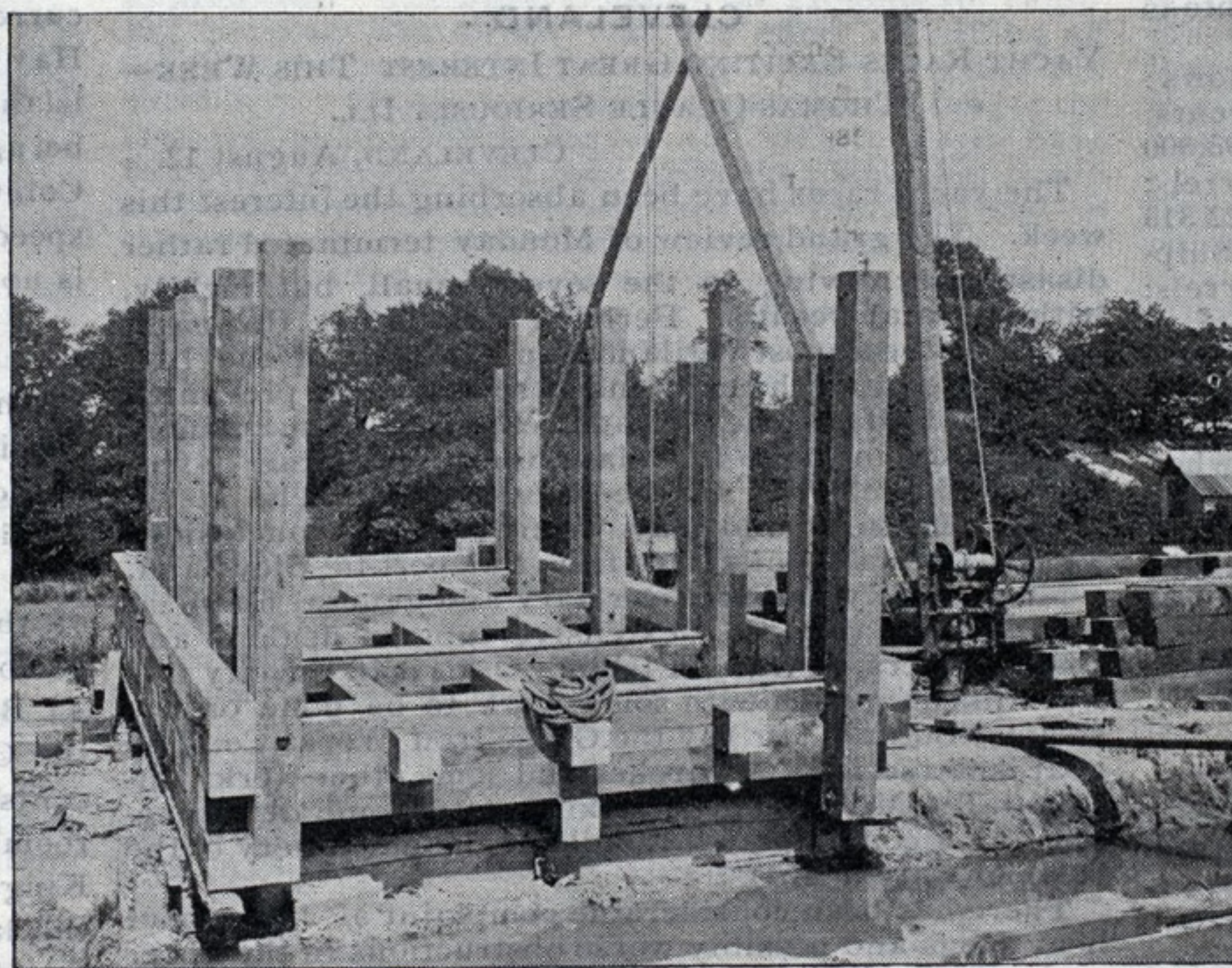
Suppose we have found that a vessel must have a traction or pull on the towline of 4,000 I. H. P. to propel it through the water at a given rate, and that we wish to apply that power by means of twin screws—required the diameter of the screws.

Rule for the power.—Divide the direct traction—4,000 I. H. P.—by the efficiency of the screw to be used. The quotient is the total H. P. that must be provided to produce the required traction or direct pull.

"But," says one, "how are we to know the efficiency of the wheel before it is made and tried?"

That is precisely the question we are talking about, and which we propose to illustrate.

It will be remembered that we have said that the efficiency depends on the pitch angle at the center of effort of the blade. This angle I have computed and



SECTION OF CRIB, READY FOR LAUNCHING.

given in the following table for wheels whose pitch varies by one-tenth the diameter, from one to two diameters. The efficiency is the square of the cosine of the pitch angles:

TABLE OF PITCH-ANGLES AND EFFICIENCY OF PROPELLER WHEELS.

Pitch in Diameter.	Pitch-angle at Center of Effort.	Per Cent of Useful Work.	Per Cent of Lost Work.
1.0	19.29	89.0	11.0
1.1	21.16	86.8	13.2
1.2	23.00	84.7	15.3
1.3	24.42	82.5	17.5
1.4	26.20	80.3	19.7
1.5	27.57	78.0	22.0
1.6	29.30	75.8	24.2
1.7	31.01	73.5	26.5
1.8	32.29	71.1	28.9
1.9	33.54	68.9	31.1
2.0	35.17	66.6	33.4

In view of the high piston speed and high tension of steam in current use, we will select a wheel of say 1.3 diameter for the pitch having an efficiency 82.5 per cent.

This, it must be remembered, is the per cent of that part of the total power delivered to the wheel, and in no way can we get any more power with that proportioned wheel. It shows what would be utilized if the wheel could work, as in a nut, without slip, and hence must be regarded as the theoretical, and not the net or ultimate efficiency, which depends largely on the skill of the engineer in adapting size of wheel to amount of work to be done.

Dividing our 4,000 I. H. P. by the efficiency, 82.5 per

cent, and by the per cent of total work delivered to wheel, say 82 per cent, we have:

$$4,000 \text{ divided by } (82.5\% \times 82\%) = 5,913 \text{ I. H. P.}$$

To this add say 20 per cent for a reserve power for emergencies, making a total of 7,095 I. H. P. that must be provided in order that we may depend at all times on a shaft thrust of 4,000 I. H. P.

The cube root of the half of this, or say 3,500, will be the required diameter of wheel, thus:

$$\sqrt[3]{3,500} = 15.15 \text{ feet, or say 15 feet.}$$

"But," says one, "that is more than the depth of water that the ship can draw."

Never mind if the wheel does run with its "back-fin" a little out of water. The damage to the wheel by running slightly out of the water will be nothing, while the damage to the coal bunkers from working with a wheel a foot too small would be a serious matter.

Multiplying this diameter by our tabulated ratio 1.3, and we have the pitch = 19.5, or say 19 feet—giving us a wheel 15 x 19 feet.

I give another example from actual practice, showing that we have found about the minimum amount of water to be acted on to afford the requisite inertia for the engine to work upon, and that we have found the place of the center of effort on blade of wheel correctly.

See "Test of the Steamer City of Lowell," as reported in Engineering News for Nov. 14, 1895, by Prof. James E. Denton, of Stevens Institute of Technology.

He informs us that the wheels are of 11.1 feet diameter, and 16.63 feet pitch, giving a ratio $1\frac{1}{2}$ diameter for the pitch; that with 111.2 revolutions per minute, making a speed of 20 statute miles per hour, the ordinary service speed, the engines developed 3,000 I. H. P., or 1,500 per wheel. Then dividing the cube of the diameter of the wheel by the H. P. developed we have

$$11.1^3 \text{ divided by } 1,500 = 1.1 \text{ cylindric feet.}$$

That is to say, each unit of H. P. has slightly more than one cylindric foot of water to act upon. And deducing the slip from the above data, we find it to be 4.7 per cent, which is evidently near its minimum limit.

Again, wheel making 126.86 revolutions per minute, and 22.19 miles per hour, and engines developing about 4,350 H. P., or 2,175 per wheel. We find the inertia for H. P. 1.11^3 divided by 2,175 = 69% of 1 cylindric foot and the slip we find to be 7.4 per cent. So that by putting on the extra power the inertia has fallen off from 1.1 c. ft. to .69 of one c. ft. per H. P., and the slip has risen from .048 to .074, or more than 50 per cent.

This shows us that about one cylindric foot is the minimum volume of water per H. P. that can afford the requisite amount of inertia for engine to work upon.

Furthermore, Prof. Denton informs us that the efficiency of the screws has reached the unusually high value of 78.3 per cent. Our table shows that a wheel of $1\frac{1}{2}$ diameter for the pitch gives 78 per cent of useful work—agreeing with his results within a small fraction of 1 per cent.

He also gives 81.7 per cent as the part of the total power delivered to wheel, and the "power of tow hull at 64 per cent," as efficiency of wheel.

Multiplying the per cent delivered to wheel, .817 by our tabular efficiency .78, we have $.817 \times .78 = 63.73\%$ for efficiency of wheel, thus agreeing again within a small fraction of 1 per cent with Mr. Denton's figures, and thereby showing that we have found the correct place of the pitch-angle or center of effort.

(CONCLUDED NEXT WEEK.)

PROPOSED NEW DRY-DOCK AT BROOKLYN.

A large new dry-dock is under contemplation at present by the John N. Robbins Company, the agents of the Erie Basin dry-docks, Brooklyn, New York. The company is now in possession of two docks, one of which is 520 feet long and 105 feet wide. The new dock is to be located to the right of these and will be 800 feet long and 150 feet wide. It will be deep enough to take in the largest war or merchant vessel afloat and will have a draft of 28 feet in the clear. Mr. Robbins, the president of the company, says that the plans have not been completed and that it is not decided when the work will actually begin.

CRIB WORK FOR PIERS AND BREAKWATERS.

AS DESIGNED BY COL. JARED A. SMITH.

A large section of the cribwork for the new east pier for Cleveland harbor was launched Tuesday by Mr. James Donnelly, of Buffalo, who has the contract for rebuilding that structure. The manner of construction is comparatively new, and embraces features of such radical improvement in former methods, in the items of stability, cost, and rapidity of construction, that a clear explanation of the system, which has been touched upon before in these columns, will be of practical bene-

wise have to be thrown out, because of waning edges. For obvious reasons, there is no bottom built for this crib, with the exception of a compartment here and there, in which a bottom is put in order that the ballast may be thrown in and the trim of the section maintained after it is in the water and sides and cross-walls have been built up. It must, of course, be understood that because of the great weight of such a section, it must be built up, before launching, only so far as is absolutely necessary to maintain its rigidity of form, and to ensure the character of the work to be perform-

be noticed that the alternate compartments are temporarily decked over. Before towing the crib out to its final resting place, it is necessary to have accumulated plenty of the stone ballast, and to have it on hand at the site of the proposed pier. The crib is then towed to the desired position, and a quantity of the ballast is thrown upon the temporary decks until the structure rests lightly on the bottom. By hauling on lines, bunting with a tug, and other means at hand, the crib is then easily brought into the exact line desired, so that the structure when completed shall be entirely plumb, and perfectly straight to the eye in a longitudinal direction. This being completed, the open compartments are partially filled with stone from the vessels, and then the ballast at first placed on the decks is thrown in. It is obvious, of course, that the ballast at first placed on the decks must not be thrown into the compartments at first, as the stone would weigh less in the water than on top of it, and the structure would float out of place; and it would be equally fruitless to throw the ballast into the bottomless compartments until the grillage was finally rested on the bottom. After the open compartments have been filled, the temporary decking is removed, and the intermediate compartments are filled with the ballast. The grillage is then ready for the superstructure. In the Cleveland east pier, now building, this superstructure will be of concrete. This will be made in blocks 9 feet long by 4 feet wide, and 3 feet thick. The crib work will come to 3 feet below the water level, and the concrete blocks will be laid upon this. It will thus require one tier of concrete blocks to bring the structure up to the surface. On the top of the concrete pier the blocks will contain, at short intervals along the edges, large iron mooring wigs, attached to rods which shall have been imbedded in the blocks when in process of moulding. This will be of great benefit to vessels tying up there.

The west pier and the breakwater, when constructed, will all be built up on the same general plan, with the slight modifications necessary to meet the objects of the work. It will be seen that this system admits of very rapid work, and removes almost entirely the necessity of working with divers. The finished part, then, will, in a few years present a most handsome appearance, instead of the dilapidated showing now made.

WILL STAY TILL NEXT WINTER.

The tour of duty of Commander Charles D. Sigsbee, the Chief Hydrographer of the Navy, expired on May 31 last, but as there was no commander's billet vacant he has been retained on duty at the Navy Department. It is expected that he will remain in his present station until the winter, when it is probable that a sea command will become vacant to which he may be assigned. To Commander Sigsbee is due the recent great progress in hydrographic work. He has been an ardent advocate of the proposition to place the coast survey under the Navy Department and to make a combined Hydro-

fit to many, and of interest to all.

The illustrations here presented show some of the crib of the new pier work built at Conneaut harbor, on the same plan, with one exception. The first illustration shows a section of the crib work, about 30 feet in length, or about as large as is convenient for launching. The end of the section is shown in the foreground. For the Conneaut pier the cribs were set on a rock bottom, which had been dredged out a few inches before the cribs were placed in position. On such a foundation undermining by water was out of the question. But in the crib work for the Cleveland piers the first row of cross-timbers from the ground project about 6 feet on each side of the crib proper. This leaves 6 to 8 inches of the crib, below those cross-timbers, to sink into the sand foundation; but upon these projections is laid planking, which forms an apron. The usual course of the volume of water thrown up by the sea striking a pier, is to drop vertically along the line of its ascent. In this way it falls with such force as to scoop out a trough if the bottom be of sand or soft mud, and eventually the crib is undermined. This apron is made to receive the impact of these falling volumes of water, and the undermining is thus prevented. With this one exception the method of construction is precisely as at Conneaut. The aprons have already been used with great success at Fairport.

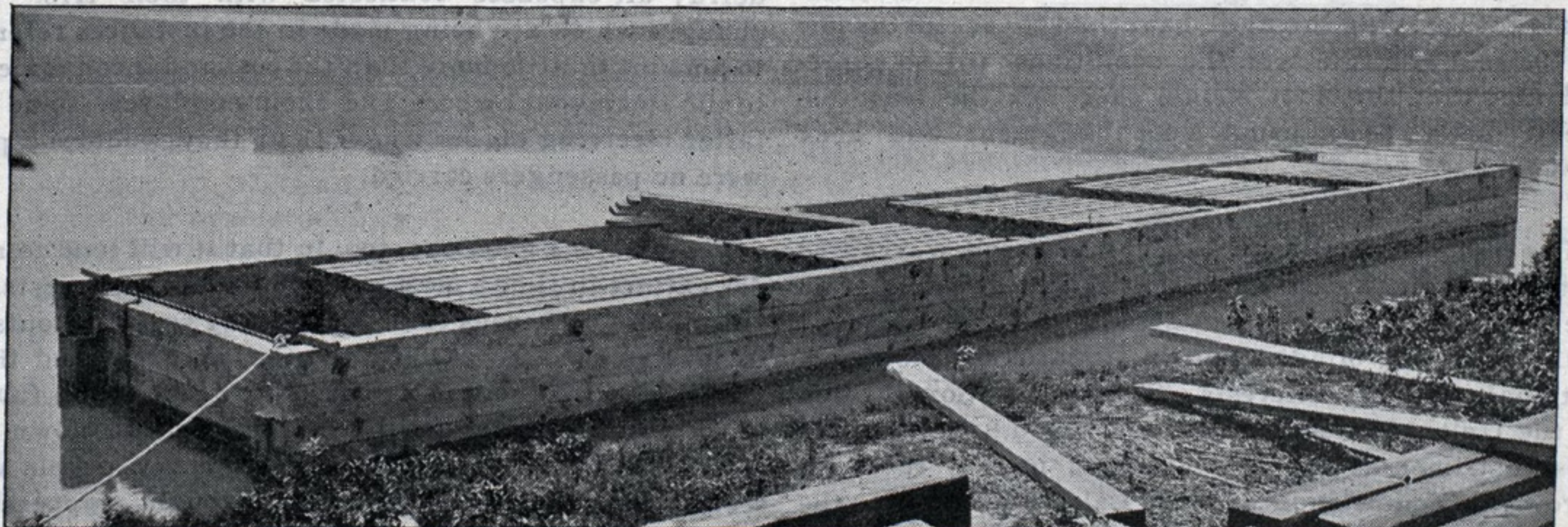
The great advantage in the work of construction lies in the absence of dovetailing, which is disapproved for other reasons than expense of building. Col. Smith's annual report for 1895 states that some old crib work which had been taken out of the water was found to be worthless, owing to the tearing away of the dovetail heads of cross-ties and cross-walls, as well as the ends of timbers framed together at angles and cribs. The water for many years, loaded with mud and sand, had been forced back and forth around these dovetails until they were so worn that the clear space was often as great as two inches, where the timbers should fit very closely to give the requisite strength or stiffness. It was due to the decking which held to the tops of the walls in places, and the fact that the stone inside had become cemented together with hard mud, so that there was no outward pressure, that the cribs had not long before fallen in pieces.

The first illustration shows the section, with four courses of timber on the sides, and two on the cross-walls, with six-inch pieces placed between and gains cut for the reception of the longitudinal strengthening timbers. Five cross-walls are shown, and these will be built up solid to the top, as will the side-walls. Thus four separate apartments are formed, in each corner of which upright square timbers are tightly fitted. To these both the cross and longitudinal timbers are tightly bolted. This is what cheapens and strengthens the work, as it is a more than efficient substitute for dovetailing, and allows the use of timbers that would other-

wise have to be thrown out, because of waning edges. For obvious reasons, there is no bottom built for this crib, with the exception of a compartment here and there, in which a bottom is put in order that the ballast may be thrown in and the trim of the section maintained after it is in the water and sides and cross-walls have been built up. It must, of course, be understood that because of the great weight of such a section, it must be built up, before launching, only so far as is absolutely necessary to maintain its rigidity of form, and to ensure the character of the work to be perform-

ed while the sections are afloat. The first illustration, therefore, shows the section ready for launching.

In the second engraving, several of these sections have been built and floated, and another is ready to go into water. These sections are towed around after launching till they are placed precisely end to end, and then begins the putting on of the timbers of the side walls. These, of course, lap over the ends of the section, where the first three courses of the side walls butt, and the section is thus made solid. The cross walls and side walls are then carried up to the requisite height, the structure sinking in the water and being maintained in its upright position by means of ballast thrown in upon those compartments which have been fitted with floors. The height, or depth, of the cribs is not limited by the height of the corner pieces as shown in the first two illustrations, as they are, it will be noticed, of irregular length, so that the splicing of them occurs irregularly and the crib is thus not weakened at any particular depth. It must also be noticed that long iron rods $1\frac{1}{2}$ inches in diameter pass through the crib from side to side, at frequent intervals to receive the outward thrust. Wherever longitudinal timbers butt, the rod is provided with an immense washer of iron, to hold the ends of both timbers. The corner timbers are fastened to side and cross walls by means of screw bolts. The arrangement is such that the bolts draw the timbers very close together and make the crib



SECTION OF CRIB, READY FOR BALLASTING AND SINKING.

vastly more rigid and strong than is possible with the old method of dove-tailing.

The third illustration shows the crib work practically completed. It has been built to a depth of say 18 or 20 feet, or about the depth of water where it is to be placed. It has been built in sheltered waters, and this is another advantage over some old forms of building, where the construction is of necessity from the shore outward, and where new work is sometimes destroyed by heavy weather before it can be completed. It will

graphic Office, which should be raised to the dignity of a bureau. His failure has been due to inaction by Congress, the Navy Department having earnestly recommended the plan which Commander Sigsbee favored. Considerable speculation is overheard as to his successor.

The Iron Age has left its old editorial rooms, Nos. 96-102 Reade street, and has removed to new and larger quarters at Nos. 232-238 William street, nearer its mechanical department.



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HERE AND THERE.

This is truly a record-breaking season. Even the lowest rates of freight that have heretofore prevailed have been undercut. The record is also broken in that it is the first year in which vessels have had to be tied up to the docks during the middle of the season, simply because there is a shortage of cargoes, without regard to rates. But there seems to be a silver lining to this last cloud—and by this phraseology we have no reference to present issues nor to the low esteem in which that metal is held by the industrial interests. Through their inability or refusal to carry ore, the vessels are unconsciously combining, in connection with circumstances, to make next season a better one than it would be otherwise. If one or two million tons of this year's contemplated output remains up the lakes this season instead of coming down at less than living rates, there will be so much added to the volume of tonnage for the season of 1897, when disturbing influences will, it is hoped, no longer have their effect on the market, and when freight rates will, in consequence, be on a better basis. The sad turning out of this year's trade is due entirely to a wave of demoralization which it was impossible to foresee, and while owners who refused to contract their boats for carrying ore at \$1 have had to accept as low as 60c as a wild rate, yet the conditions are so unprecedented that this fact should cast not the least discredit upon their usual good judgment and keen foresight.

The friends of Cuba's cause, while well warranted in their efforts to secure for that island freedom from the oppression of Spain, should not allow their enthusiasm to blind them in regard to their own national, or local interests. The annexation of Cuba by the United States, for example, would have an effect most detrimental to lake interests, in that it would throw into competition with the Lake Superior ores the immense quantities of Cuban ores, which can be produced, at a small expense, and which, even now, with a protective duty enforced, have made their way into the market as far west as the Alleghenies. A few years ago, when it was proposed to wipe out the tariff on foreign ores, a large and influential delegation of ore and vessel men went down to Washington on behalf of the lake region, and secured the retention of about half the former duty, which was cut from 75c to 40c per ton. Even the late Mr. George H. Ely, of Cleveland, used his efforts until his sudden death to secure this protection from Cuban mines in which he was himself a large owner. Mr. Ely never better demonstrated his true

greatness than when he thus made his private interests secondary to what he considered the rights of the large investors in the Lake Superior mines, railroads, docks, and vessel property.

The unsettling effect of the discussion of money problems is weekly becoming more apparent, and the spell of comparative idleness which has tied so many lak vessels to the docks is almost directly traceable thereto. But it is not well to lose sight of the great truth that money will always be scarce—whether it be sound money or cheap money—so long as there is a steady flow of it in a direction to eventually carry it out of the country in volumes in excess of the amount of money coming in. The United States has labored under this disadvantage for some years now, and not enough attention has been paid to the seemingly smaller channels of drainage. It was to prevent this that the protective tariff principle was adopted; but nearly everything was lost sight of but manufactures and a few agricultural and mineral products. The principle of protection was not carried far enough; American labor and American shipping were not duly protected. Hordes of foreigners have come to the United States to earn money, much of which has been expended in their native lands. The thought of subsidizing shipping was at once put down as unconstitutional, though why the Constitution can forbid the purchase by the United States of certain privileges to be available in time of emergency, and yet allow out-and-out bounties to be paid on maple sugar and the like purely for the sake of encouraging the industry, is one of the questions which only the wily politician could answer. If the McKinley bill had provided for a differential in the duties, favoring all goods brought to this country in American ships, the good effect of this single provision would have been clearly demonstrated, and would have increased very largely the volume of money to come directly into the commercial coffers of the country. The amount of freights paid annually by American importers and exporters to foreign ships is something stupendous, and only the most minute proportion of it is spent by these ships and their owners in American territory. Congress can hardly do better than to enact the Elkins bill as soon as it convenes in short session. There is nothing likely to show such speedy results.

The practice of utilizing as a source of revenue the passenger licenses taken out for nearly all freight boats is beginning to obtain on the lakes. Owners show, still, as a rule, some hesitancy in adopting this plan, as they are so accustomed to carrying their own and other people's guests all season that they are afraid of seeming inhospitable. The practice, however, has a great deal to recommend it, and will be hailed with great pleasure by the hundreds of people who would enjoy this manner of taking an outing better than any other, but who would not ask such a favor unless they were allowed to pay a sufficient amount to liberally defray all expenses connected with their trip. The changes which are being made in the instances referred to amount to little more than the cost and inconvenience to the steamboat owners and their employes, some the latter receiving higher wages than they would be paid were no passengers carried.

The plan is a good one, too, in that it will tend to render extinct in time a most obnoxious class of "guests," a class more numerous than is generally supposed outside of marine circles. Of course the shippers and their families, with others in a position to give return favors to the vessel interests, will be carried up and down the lakes as formerly; but there are many people who secure passage on these trips through shippers or others, who are in no position to do anything in return, and these are the people who almost invariably make the most trouble. These third parties through whose influence the passage is secured often ask the privilege for people whose only claim to the trip is the amount of nerve they possess, and who are granted the privilege because good-natured people hate to refuse them. These usually belong to the class who manage to keep boats waiting a few minutes, who lie in bed late in the morning and expect the steward to get them a second breakfast; who look for the bill of fare of a four-dollar-per-day hotel, and who expect fruit and wines to be left on the sideboard for their use during the day. The

quarters afforded on the modern lake boats are better than these people enjoy at home, and the bill of fare is usually superior; and the snobbishness of this class of guests is usually stamped upon their actions very soon after leaving port.

OBITUARY.

Capt. Conrad H. Starke, one of the owners of the Milwaukee Tug Boat Line, and prominent in Milwaukee marine and commercial circles, died suddenly last Tuesday morning as the result of injuries sustained by being thrown from a buggy the day previous. Capt. Starke was extensively interested in steamboat, tug, dredging, and dry-dock property.

CAPT. RICHARD D. GARDNER.

Capt. Richard D. Gardner, of the steamer Commodore, died last Saturday, August 9, after an illness of three weeks. He was only 44 years of age, and has been sailing in Western Line steamers for 26 years, having entered the service at the age of 18. He has been in command of steamers of that line for a great portion of that time, sailing the Arabia, Milwaukee, and Commodore. He has lived in Buffalo, and his wife and five children survive him.

CAPT. HARBOTTLE'S CAREER.

Capt. Thomas E. Harbottle, of the steamer Havana, whose death was announced in last week's issue, had been ailing for two years past. On Sunday the 20th inst., while the boat lay at the Quincy dock, he became very ill, and his stomach refused to retain either food or medicine. A physician was called promptly, but his best efforts were without avail. His brother Neville was with him at the time of his death, which occurred the following day.

Capt. Harbottle was born in Hamilton, Ont., in 1857, and had sailed the lakes for twenty years. His father and namesake formerly lived at Toronto, and was supervising inspector of steamboats for Canada. Among the late captain's commands, beside the Havana, was the steamer Como, which he sailed during 1881 and 1882, and the schooner Foster during 1889 and 1890. He was for a time mate of the propeller Ontario (Br.) and of the Gogebic.

NOTICE TO MARINERS.

BRADDOCK POINT LIGHT STATION.

Notice is given that on or about August 17, 1896, a fixed white light, of the three-and-one-half order, will be established in the tower recently erected on the point of the south shore of Lake Ontario about 2¼ miles west-northwesterly of Braddock Point. The light will illuminate 180° of the horizon and will be visible from all points of approach from the lake, excepting from the eastward to the southward of the bearing W. by N. The focal plane of the light will be 92½ feet above mean lake level and the light may be seen 17.8 miles in clear weather, the observer's eye 15 feet above the water.

The light will be shown from a black lantern surmounting an octagonal, pyramidal, red-brick tower attached to the west side of a two-story red-brick dwelling with black slated roof. The parapet and gallery of the tower are brown. The tower and dwelling are on ground about 7 feet above lake level and stand about 100 feet back from the shore line. A small one-story red building and a red-brick barn are located near the tower, to the southward, and a red-brick oil house stands between the tower and the lake.

The approximate geographical position of the light, as taken from Chart No. 66 (Lake Ontario Coast Chart No. 4) of the United States Survey of the Northern and Northwestern Lakes will be: Latitude, north, 43° 20' (28''); longitude, west, 77° 45' (52''). Tangent to shore to the eastward, SE. by E. ¾ E., 1¼ miles; Genesee Light-house, S. 56° 45' E. (SE. by E. ⅛ E.), 9¾ miles; tangent to shore to the westward, W. by N., 10¼ miles. Bearings are true, and distances are in statute miles.

THREE BIG CARGOES.

Three of the largest cargoes on the lakes, have left Chicago with grain during the past eight days. On the 7th inst. the Queen City took on 205,500 bushels of grain, amounting to 5,754 tons. She drew 16 feet 6½ inches. The steamer W. D. Rees was the second, with 124,500 bushels of corn and 61,650 bushels of wheat, amounting to 5,335 tons. Then came the Coralia, which got away on the night of the 8th with 186,130 bushels of corn, or about 5,212 tons, drawing 16 feet of water.

SHIP BUILDING AND REPAIRS.

NOTES AT THE YARDS.

The continued dullness in all trades is mirrored in shipbuilding circles. There is little prospect for new work for private parties, and it is evident that yard room will not be held at a premium during the coming year. As a result, it is believed that several builders will see what they can do on the new revenue steamers which the Treasury Department proposes to have built for the lakes. The specifications for these have not been completed, and as yet no invitations have been extended to builders to submit proposals. The new steamers will be planned much on the order of the revenue boat now building at the Globe shipyard, Cleveland, but there will probably be a very great difference in their appearance, as the alterations which are likely to be made will be large in the rearrangement and reduction in size of deckhouses. The topgallant forecabin will, it is expected, be considerably larger, and the masts may be built with poops aft. This will allow of more clear deck space amidships, and consequently guns can be handled to greater advantage, should it ever prove necessary to convert them into cruisers in active service. On the boat now building there is not much space for handling guns. The new boats, like the one near completion, will doubtless be provided with torpedo chutes, and all three, when completed, will without question be rather formidable boats should any unpleasantness ever arrive where interposition of force should become necessary.

The revenue steamer building at the Globe yard, which will probably be christened the Walter Q. Gresham, is to be launched about the 29th. The Rockefeller steamer Sir William Siemens, sister ship to the Sir Henry Bessemer, will probably be delivered to her owners on the 25th.

The steamer Rosemount, built by Wood, Jenks & Co., of Bill Quay-on-Tyne, Eng., for the Montreal Transportation Co., of Kingston, has reached the lakes, and will soon be in active service. The cost of the Rosemount was \$110,000.

The tug O. C. Steadman, built by the Ship Owners' Dry Dock Co. for Huron parties, has gone to Huron, and is giving great satisfaction there. The dry-dock company still retain the ownership.

The steamship John Ericsson, built by the American Steel Barge Co. for the Bessemer Steamship Co., will go into commission sometime this week. Her tow barge, however, will not be ready for a month. The launch, which had been set for Saturday last, had to be postponed, but the management say that she will be delivered on contract time.

GENERAL REPAIR NOTES.

CLEVELAND.—The enforced leisure of the boats is giving the dry-docks plenty of work, and there is just now rather a rush. At the Cleveland dry-dock the Saxon has a large bottom repair job, including twelve damaged plates and broken frame. The material was removed, and she went out of dock to let the Parks Foster in for permanent repairs to the damage sustained at Sandusky some weeks ago. This damage is about amidships, and comprises ten damaged plates and several broken frames and badly jammed floors. Her repair bill will aggregate over \$5,000. The Globe Iron Works Co. is attending the repair work. The Sagamore, which was in last week, had nine plates damaged. The D. C. Whitney goes in to repair some bottom damage.

The steamer Bothnia (Br.) is expected to arrive Thursday, to have new steel arches put in.

Some repair work has been done on the German at the Globe yard, and several Menominee boats are booked for docking.

At the Ship Owners' dock the H. A. Tuttle is still in. Her repairs are quite extensive, and include refastening and recalking all over, some new keel and planking, part new stern, and repairs to rudder and shoe. The J. H. Devereux was in for five days while her shoe and rudder were being repaired. The Globe people did the work. There were also several plates taken off her forward, rerolled, and replaced. The Fedora goes in Thursday for repairs to her shoe and a new rudder. The schooner Yukon and tug Curtiss were docked for repairs to rudder and pintle, and the yachts Say When, Mina, Corsair, and Nava were in for a general over-

hauling before the yacht races. The tug R. K. Hawley is down from Huron and a new shaft will be placed in her. The H. D. Coffinberry, which was in over a week ago, had her bottom, deck, and part of her top-sides recalked.

CHICAGO.—Captain William Baker, who recently purchased the schooner Presto, has given her a thorough overhauling comprising a new stern, new frames, part new decks, some new outside plank, new bulwarks and rail, new windlass and bits, and a new cabin on deck, besides recalking. The Presto is now ready for sea.

DETROIT.—The schooner Col. Ellsworth, which was released from the beach above the Sault, is now at the upper dry-dock for repairs, which will not be so extensive as had been at first thought, as she appears in very fair condition. The Egyptian was in the lower dry-dock getting sufficient repairs to raise her from an A2½ to an A2 class. The steamer Thomas Wilson arrived Thursday for her new high-pressure cylinder, and got away Monday morning. S. F. Hodge & Co. did the work, and it is considered a very quick job. The John Owen is at this firm's dock for a new high-pressure cylinder.

BUFFALO.—The dry-docks have two pretty stubborn wrecks to deal with for mid-summer. The Samoa, which was supposed to be a small job, has loomed up into a veritable rebuild. So many frames are broken or scraped away from their fastenings that she will need to be pretty nearly a new boat when she comes out again, which will not be until sometime next week. Over 60 of her frames were broken, and others badly stove. As to the St. Louis, which was knocked out by the G. F. Williams, it is not known how much it will cost to fix her up, but it will not be done for a penny by any means. J. L. Crosthwaite, her owner, says she is ruined. Her bilge is badly crushed in, and her repairs will need a practical rebuild.

STURGEON BAY.—The steamer J. E. Rumbell was in Reiboldt, Wolter & Co.'s dry-dock this week for a new Sheriff's wheel, 5 feet 2 inches in diameter. The E. C. Hart had a new key and collar put on her shaft to hold the wheel better. The tug M. A. Knapp had her bottom calked and her bilges resheathed with iron.

REPAIR NOTES.

The schooner B. W. Parker is getting bottom repairs at West Superior.

The City of Mt. Clemens had her bottom cleaned and some calking done at Gilmore's dry-dock, Toledo.

The steamer Volunteer is repairing disabled machinery at Alpena.

The tug Crusader is to be thoroughly rebuilt at Port Huron.

FLOTSAM AND JETSAM.

Frank Hagan, fireman on the Thomas Maytham, was killed by the cars at Fairport Friday.

The little schooner Wollin, Capt. Emil Poop, was sold under the hammer at Milwaukee last week for \$1,140.

Thomas King, deckhand, fell into the hold of the steamer Ira H. Owen at Fairport last week. He died on Friday.

A Milwaukee dredge is cutting a 19-foot channel at Ludington, between Lake Michigan and Pere Marquette Lake.

Ray Ladue, fireman on the Sanilac, was accidentally drowned at Saginaw Monday night, while trying to board the steamer.

The old hull of the tug Tender (Br.) which was lying at Playfair's coal dock, Midland, was destroyed by fire a few evenings ago.

The Aragon has passed through the Welland canal with the largest wheat cargo that ever went through the canal. It consisted of 81,500 bushels.

The Lighthouse Board has awarded a contract for constructing seven cribs in Hay Lake channel, St. Mary's River, to Eslow & Monroe, of Charlevoix, Mich., at their bid of \$5,622.

Capt. M. A. Tuttle, who has sailed the steamer Lora, of the Manistee Transit Co. for two seasons past, has been given command of the new wooden steamer Appomattox. He is succeeded in the Lora by Capt. C. D. Ross, formerly her first officer.

Andrew Cameron, diver, at work on Loch Treig, Scotland, dived to a depth of 200 feet recently. This, it is said, is the greatest depth ever reached by submarine diving. Up till this the record dive was that at Brussels, where a diver named Valmont reached the depth of 160 feet.

WRECKS AND WRECKING.

The past has been a week of mishaps, and while no total losses are recorded, the casualties are such as will give the dry-docks a good deal of work to do. A collision between the schooners George L. Wrenn and Apprentice Boy is fully described in our Chicago letter. The little schooner Emeline capsized on Lake Michigan, and may not be recovered; but her crew escaped in safety. The City of New Baltimore had her pilot house wrecked at Milwaukee on Monday of last week by colliding with a bridge, the draw of which failed to swing in time.

The only fatality occurred in a collision Sunday between the steamer Normandie and the yacht Azalea, in which the latter's owner, Edward Hinkle, of Detroit, was killed. The Normandie was bound up and took a sheer when abreast of Port Huron, crushing the Azalea, which was lying at the dock. The damage to the yacht is fully \$2,000. The Normandie also struck the Saginaw lying at the dock breaking her stern and causing her to leak badly.

The steamer Norseman broke her crosshead on Lake Superior Monday afternoon, and was towed to Houghton for repairs, which will consume a week.

The steamer Wm. H. Stevens, while tied up to a dock at the Sault Monday, was struck by the Panther, and had her upper work badly smashed. The Panther received some slight damage to mast and cabin.

The owners of the steamer George F. Williams, which struck and badly damaged the St. Louis at Buffalo the other day, allege that the accident was caused by the Williams' machinery becoming steam-locked.

The wreck of the schooner Dauntless, which was lost off Rond Eau July 9, was located in that vicinity Thursday. On the same day Capt. E. Dunn, of the D. G. S. Petrel, located what he believes to be the Little Wissahickon, twenty-two miles south and west of Rond Eau, and three miles north of the boundary line. The Little Wissahickon was also lost on July 9.

The Thompsons, of Port Huron, have bought the wreck of the tug Crusader, which was burned at the Sault two years ago. She has been taken to Port Huron, and will be rebuilt into a first-class wrecking tug.

NEW HYDROGRAPHIC CHART—GEORGIAN BAY.

A long-felt want of Upper Georgian Bay navigators has been met in the issuing by the Hydrographic Office, of a chart, in large detail, of this bay from French River to Little Current and Cabot Head. This includes the greater portion of the shores of Grand Manitoulin and the neighboring islands, and the new ranges, and the results of all late soundings are carefully given. A scale of statute miles, extending the entire length of the chart from top to bottom, greatly facilitates calculations for those accustomed to compute distances by this standard of measurement. The price is \$1.25. Furnished promptly upon application at THE MARINE RECORD offices, Fourth Floor, Western Reserve Bldg., Cleveland.

News has been received at Tacoma of the establishment of another steamship company at Tokio, to be called the Daito Kitzen Kaisha, with a capital of 2,000,000 yen (about \$1,000,000). The Japan Weekly Gazette says the new concern proposes to open a regular service of steamers between Yokohama and Portland, with the object of effecting connections with the Oregon Railroad. According to the present plan steamers of 5,000 tons each are to be employed on the new line. The signatures of the projectors are being taken preparatory to applying to the authorities for a charter. It is said the proposed company, after official permission has been granted, may amalgamate with the Toyo Kizen Kaisha (Oriental Steamship Company).

State Engineer and Surveyor Adams, of New York, has completed the plans and specifications for the first piece of work to be accomplished under the \$9,000,000 canal improvement appropriation. The plans are for that portion of the Erie canal between and including locks 21 and 22 at Rexford flats, a few miles below Schenectady. The locks are to be lengthened and the canal is to be deepened two feet, while vertical walls are to be built between the locks. The work will cost \$160,000 and is soon to be advertised by Supt. Aldridge, of the State Department of Public Works.

U. S. MINERAL PRODUCTION IN 1895.

The report of the Geological Survey for the calendar year 1895, just made public, shows that the total value of the mineral products of the United States for the year increased over \$80,000,000 beyond the value for 1894, or from \$527,368,594 to \$611,795,290. The report continues with the following comments: "This increase is a long step towards recovery from the depression to which the mineral industries, like all others, have been subjected. The total value is slightly less than the greatest ever known, which was over \$648,600,000 in 1892. In terms of quantities produced, instead of value received, 1895 is greatest. In other words, prices are lower. If we consider for a moment the record of the total values recorded in these reports since 1880, the increase from \$350,319,000 to \$611,795,290 is significant, and while it is impossible to select any year as a normal one from which to note increases and decreases and to record the permanent increase in the mining industry, still the average for these 16 years gives a fair approximation to what our normal mineral products should have been half-way between these dates, or in 1888. Comparing this computed normal product with the actual products, we see that the average yearly gain due to the general growth of the industry should be about \$25,000,000, or the product for 1895 should have been \$670,000,000. The great products of 1892 and 1895 show the ease with which the mines can respond to any unusual demand. It shows that the capacity is significantly greater than the ability to market the product. In fact, it is difficult to confine the large capacity to actual requirements. With very slight encouragement the product takes a phenomenal stride. In 1892 and 1895 the product most difficult to hold in check has been iron. This product easily controls the variations in the total value, either by the quantity produced or by the changes in price.

The increase output of iron in 1895 was necessary because of the great retrenchment in 1894. The railroads ordered as little iron as possible in that year, but ordered freely in 1895 to take advantage of prices while they were still low but advancing. This advance was a marked industrial feature of the year and continued until September.

IRON AND STEEL.—The declining tendency in production in 1894, noted in the previous report, was changed in 1895 to one of the most remarkable increases in production of pig iron known in the history of the industry in the United States, it being from 6,657,388 long tons in 1894 to 9,446,308 tons in 1895, or nearly 42 per cent. This is the largest product ever attained in this country, the nearest approach to it being in 1890, when the output was 9,202,703 tons. The value increased from \$65,007,247 to \$105,198,550, or from \$9.76 to \$11.13 per ton. The value per ton in 1890, the year of nearest approach to 1895, was \$16.43.

IRON ORES.—The production of iron ores in 1895 was 15,957,614 long tons, valued at \$19,219,684, as compared with 11,879,679 long tons with a value of \$13,577,325 in 1894. Twenty-five states and territories contributed to make up this total in 1895, an amount exceeded only by the outputs of the years 1890 and 1892. A comparison between the quantities reported indicates an increased production in 1895 of 34.33 per cent on the total for 1894, and with but six exceptions, all of the iron ore producing states participated in this advance. Owing to contracts that were made in advance, the average price per ton of iron ore was not as high in 1895 as in years previous to 1894, but the value per ton in 1896 bids fair to be much higher.

LIMESTONE FOR IRON FLUX.—This product naturally followed the course of the iron industry and showed a large increase, or from 3,698,550 long tons in 1894, worth \$1,849,275, to 5,247,949 tons in 1895, worth \$2,623,974.

GOLD AND SILVER.—The steady increase in the gold product of the United States since 1892 was kept up during 1895, increasing from 1,910,816 ounces in 1894 to 2,273,629 ounces in 1895. The value of these products was \$39,500,000 and \$47,000,000 respectively. The production of silver continued to decline and fell to 47,000,000 ounces in 1895 from 49,501,122 ounces in 1894, with coining values respectively of \$60,766,300 and \$64,000,000.

COPPER.—Copper production followed the upward tendency of the other metals and increased from 360,844,218 pounds in 1894 to 381,106,868 pounds in 1895. The

value increased from \$33,141,142 in 1894 to \$38,682,347 in 1895. All of the foregoing was from domestic ores.

Following is a statement of metallic products during 1895:

	Quantity.	Value.
Pig iron, long tons.....	9,446,308	\$105,198,550
Silver, coining value, troy ounces.....	47,000,000	60,766,300
Gold, coining value, troy ounces.....	2,273,629	47,000,000
Copper, pounds.....	381,106,868	38,682,347
Lead, short tons.....	161,440	10,655,040
Zinc, short tons.....	89,686	6,278,020
Quicksilver, flasks.....	36,104	1,337,131
Aluminum, pounds.....	920,000	464,600
Antimony, short tons.....	450	68,000
Nickel, pounds.....	10,302	3,091
Platinum, troy ounces.....	150	900
Total.....		\$270,453,979

The production of non-metallic minerals for the year, with recapitulation and total, is given as follows:

	Quantity.	Value.
Bituminous coal, short tons.....	135,118,193	\$115,749,770
Pennsylvania anthracite, long tons.....	51,785,122	82,019,272
Building stone.....		34,688,816
Petroleum, barrels.....	52,983,526	57,691,279
Miscellaneous, including natural gas.....		50,192,174
Total.....		\$340,341,311
Total value of metallic products.....		270,453,979
Estimated value of mineral products unspecified.....		1,000,000
Grand total.....		\$611,795,290

*NOTE.—These are itemized in the full report.

SANDUSKY HARBOR IMPROVEMENT.

Col. Jared A. Smith opened bids last Friday afternoon on the harbor work to be done at Sandusky, whose share in the river and harbor bill is \$40,000. The project mapped out is for 22,000 yards of dredging in the outer bar, 20,000 yards on the dock channel, and the dredging of the straight channel as far as possible with any unexpended balance. It also includes a 1,200 foot jetty on which bids were asked. The abstract of the bids was as follows, and if all the work is awarded to one firm, John Stang, of Lorain, seems to be the successful bidder.

NAME OF BIDDER.	Outer Bar Work.	Dock and Channel.	Straight Channel.	Amount of dredging allowed on Straight Channel—Yards.	JETTY.			
					Stone, per ton	Brush Matting Per sq. yd.	White Oak Piling—each	Total Cost of Work.
James Rooney, Toledo.....	17c	15c	12c	68,833				
John Stang, Lorain.....	12½c	12½c	12½c	77,000	\$1 09	\$0.29	\$11	\$24,636
Carkin, Stickney & Cram, Detroit.....	14c	14c	9½c	89,436	1 37½	59	10	33,146
L. P. & J. A. Smith, Cleveland.....	18c	18c	18c	41,300	5 00	40	15	61,900
J. H. Breyman & Bro., Toledo.....	15c	12c	12c	77,500				
W. E. Friday, Pittsburgh.....					2 50	1.25	15	61,900

TACOMA'S OCEAN COMMERCE.

Harbormaster Hoflin makes the following report of the ocean commerce at the Port of Tacoma for the month of July, 1896:

IMPORTS.	VALUE.
Two cargoes Oriental merchandise per N. P. S. S. Breemar and Tacoma.....	\$ 680,328.64
Previously reported.....	1,433,415.32

Total imports seven months.....	\$2,113,743.96
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EXPORTS.	VALUE.
44,104 barrels of flour to Japan and China.....	\$ 120,514.00
2,144,000 ft. lumber, France and Australia.....	18,808.00
Miscellaneous mdse. to Japan and China.....	386,383.00
" " British Columbia.....	25,678.85
26,900 tons coal to San Francisco.....	80,700.00
3,535,000 feet lumber coastwise.....	29,225.00

Total.....	\$ 661,308.85
Previously reported.....	3,177,019.19

Total exports seven month.....	\$3,838,328.04
Exports same period last year.....	2,587,915.93

Increase over last year..... \$1,250,412.11
Inward registered tonnage, 43,456. Outward registered tonnage, 40,575; inward cargo tonnage, 8,435; outward cargo tonnage, 57,806; deep sea arrivals: 2 British, 3 Norwegian, 1 German, 26 American, total 32; departures, 29.

The Canadian Association of Marine Engineers, St John, N. B., recently closed a very successful season of meetings. During the winter season (Dec. to April), Geo. R. Davitt, of the St. John Grammar School gave the benefit of his services to the association in conducting a series of lessons in mathematics, which proved of great value to the members.

TRADE AND INDUSTRIAL NOTES.

The Sintz Gas Engine Company is about to erect a factory at Grand Rapids, Mich., 60x90 feet, two stories high.

The Pusey & Jones Co., of Wilmington, has been awarded the contract to build a side-wheel freight and passenger steamer for use in Venezuela. The boat will be 131 ft. long, 25 ft. beam and 5 ft. 8 in. in depth.

Owners of river craft and others interested in property in and abutting on the rivers, have petitioned the city of Pittsburg to construct a fireboat.

The Waterbury, Conn., Democrat, in its issue of August 5, devotes over three columns to a description of the large establishment of Randolph & Clowes, recently described at some length in THE RECORD.

Abram Smith & Sons, shipbuilders, hand their patrons a neat card giving the sailing distances from their shipyard at Algonac to all the principal ports on the Great Lakes.

The new Rockefeller steamship Fairbairn, recently launched at Wyandotte, contains two separate electric lighting plants of the Fountain-Crossing Co.'s system.

W. Frank West, at present mechanical engineer with the Gas Engine and Power Company, of New York, has bought a half interest in the yacht-building establishment of George H. Saunders, at Bristol, R. I., and the change in the firm name will take place September 1st. It will then be known as the Saunders & West Company. Mr. West is the inventor of the West safety water tube boiler for steam yachts, and the manufacture of these boilers will be carried on in connection with the work of boat building.

A POPULAR BOILER.

The Alma Water Tube Boiler Co. have supplied the following steam yachts with boilers since the last cruise of the New York Yacht Club: Gretcher, John E. Reyburn; Arcturus, Rutherford Stuyvesant; Parthenia, John B. Roach; Giralda, E. S. Renwick; Indolent, J. C. Rhodes; Illawarra, Eugene Tompkins; Corsette, C. A. Tatum; Vesta, Henry A. Laughlin; Orienta, E. R. Ladew; Magnet, Thomas A. Howell; Valina, William H. Post; Chepeta, C. W. Wharton; Iduna, F. A. Foster; Marion, N. Witherell; Kalolah, C. L. Hubbard; Ardath, J. A. Aspinwall; Aida, W. T. Douglas. This shows how well the Almy boiler is appreciated by yachtmen.

VISIBLE SUPPLY OF GRAIN.

As compiled for THE MARINE RECORD by George F. Stone, Secretary Chicago Board of Trade, August 8, 1896:

CITIES WHERE STORED.	WHEAT Bushels.	CORN Bushels.	OATS Bushels.	RYE Bushels.	BARLEY Bushels.
Albany.....		20,000	30,000	5,000	
Baltimore.....	1,405,000	482,000	639,000	23,000	
Boston.....	1,120,000	303,000	284,000		
Buffalo.....	1,105,000	452,000	122,000	118,000	265,000
Chicago.....	13,583,000	6,402,000	1,444,000	309,000	11,000
Cincinnati.....	8,000	2,000	14,000	2,000	
Detroit.....	361,000	14,000	16,000	38,000	
Duluth and Superior.....	6,267,000	12,000	385,000	255,000	67,000
Indianapolis.....	437,000	123,000			
Kansas City.....	920,000	23,000	7,000	5,000	
Milwaukee.....	161,000	1,000	95,000	341,000	25,000
Minneapolis.....	13,888,000	15,000	108,000	65,000	14,000
Montreal.....	282,000	58,000	275,000	6,000	35,000
New York.....	1,655,000	224,000	1,397,000	46,000	48,000
Oswego.....	72,000		64,000		
Peoria.....	63,000	55,000			47,000
Philadelphia.....	138,000	16,000	213,000	7,000	
St. Louis.....	665,000	224,000	84,000		
St. Louis.....	1,741,000	831,000	37,000	6,000	
Toledo.....	138,000				
Toledo.....	613,000	71,000	27,000	93,000	
Toronto.....	141,000				22,000
On Canal.....	488,000	282,000	972,000	235,000	40,000
On Lakes.....	1,387,000	2,129,000	612,000	72,000	65,000
On Mississippi.....		311,000	50,000		
Canal Total.....	46,429,000	12,188,000	6,945,000	1,626,000	639,000
Corresponding date 1895.....	37,839,000	4,613,000	3,925,000	254,000	44,000

PROPOSAL.

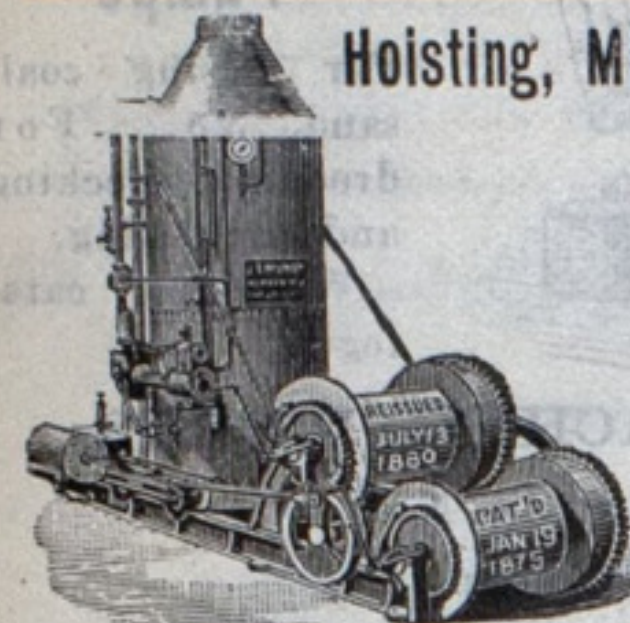
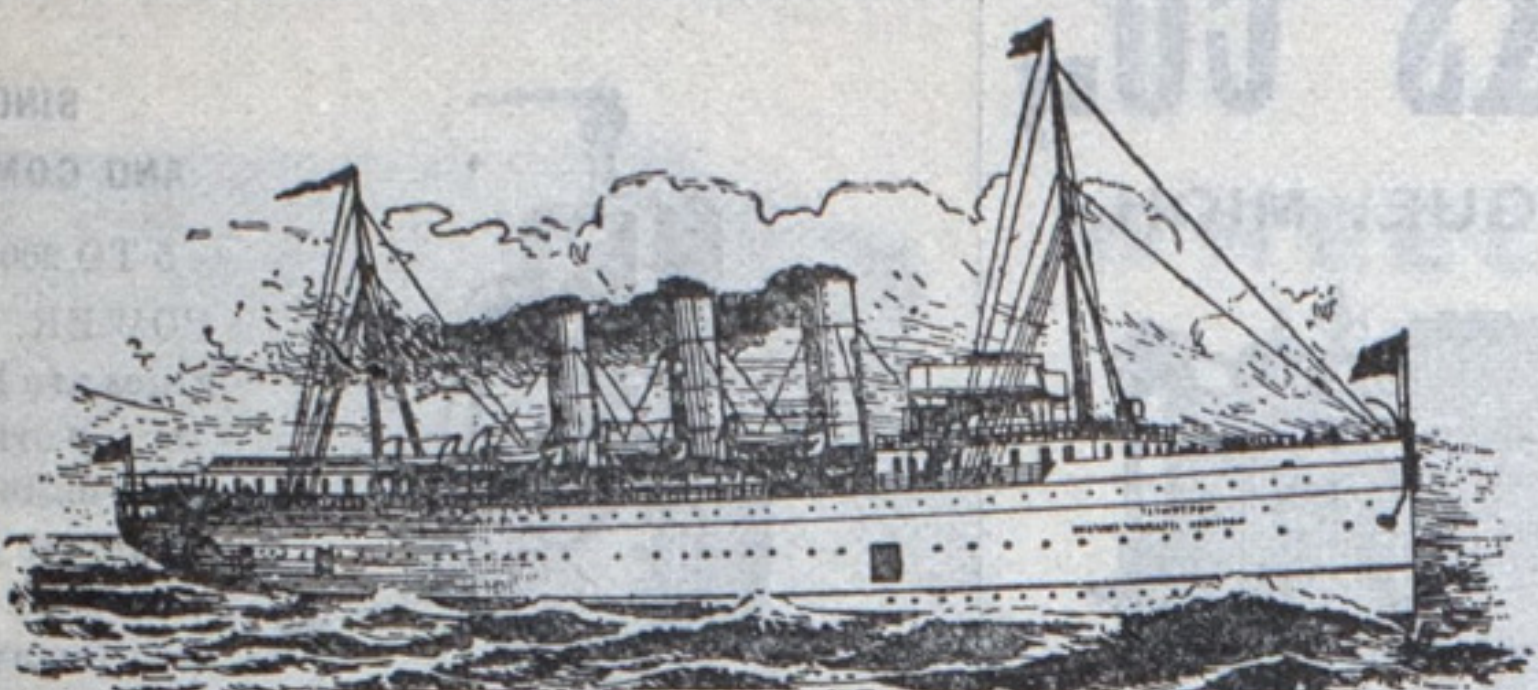
U. S. ENGINEER OFFICE, 1637 Indiana Ave., Chicago, Ill., Aug. 3, 1896. Sealed proposals for the following river and harbor works will be received here until 12 M. Aug. 24, 1896, and then publicly opened: Dredging in Calumet River, Ill. Dredging in Calumet Harbor, Ill. Pier extension, Calumet Harbor, Ill. Information furnished on application. W. L. MARSHALL, Maj. Eng'rs. 32-33

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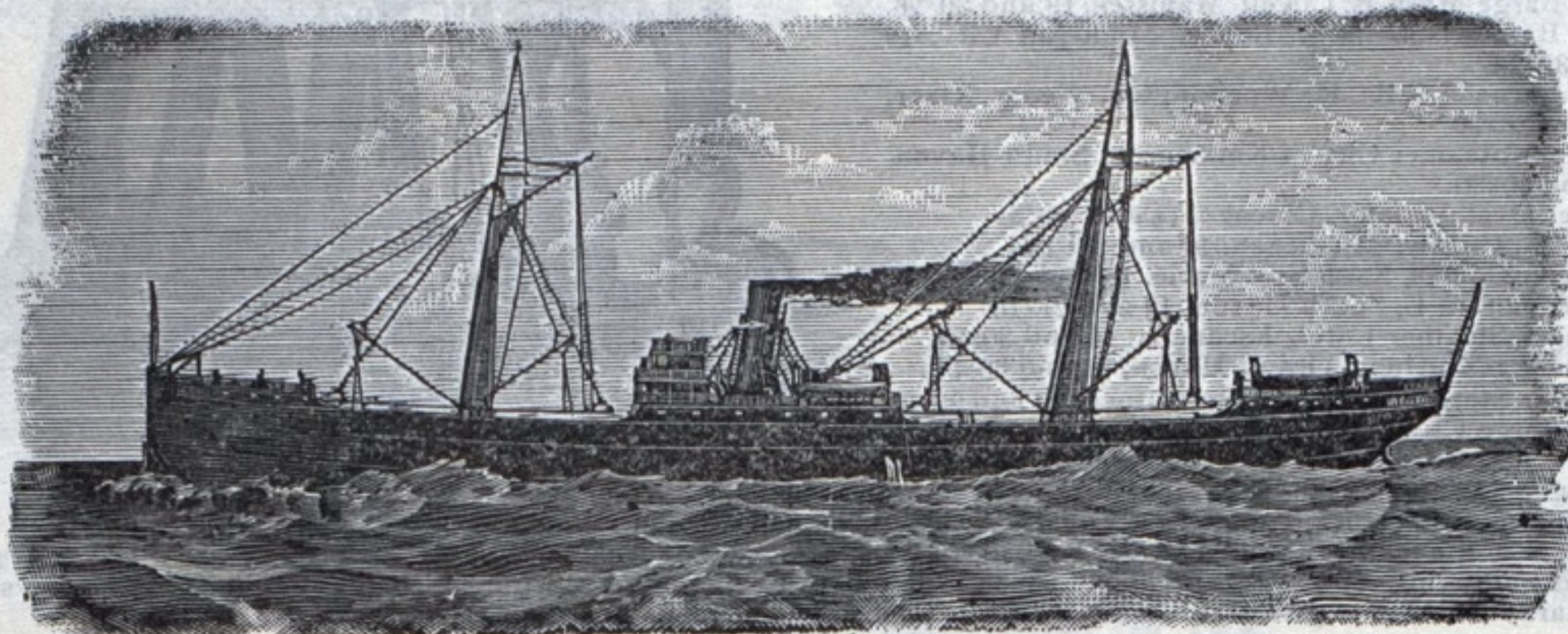


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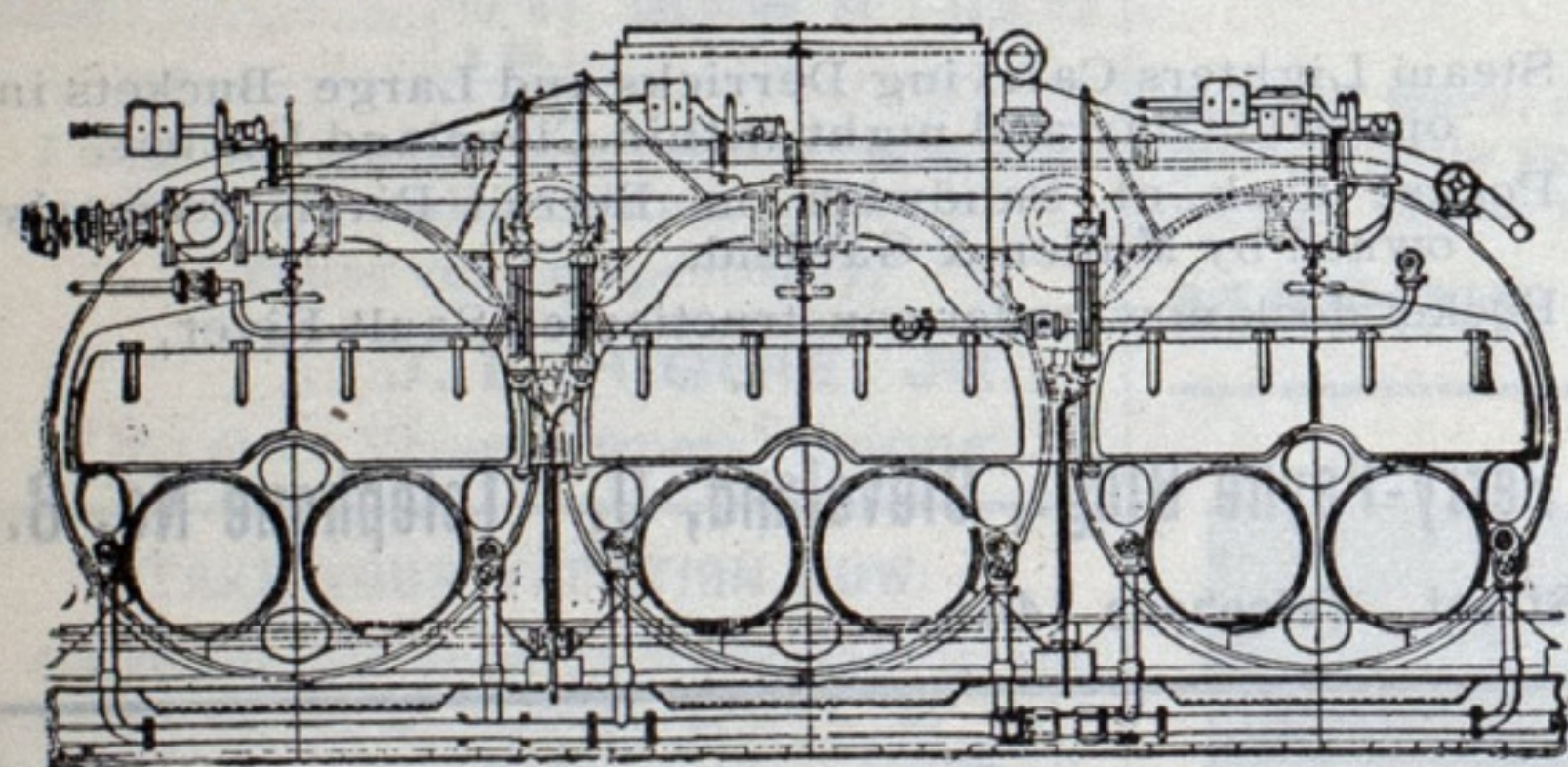
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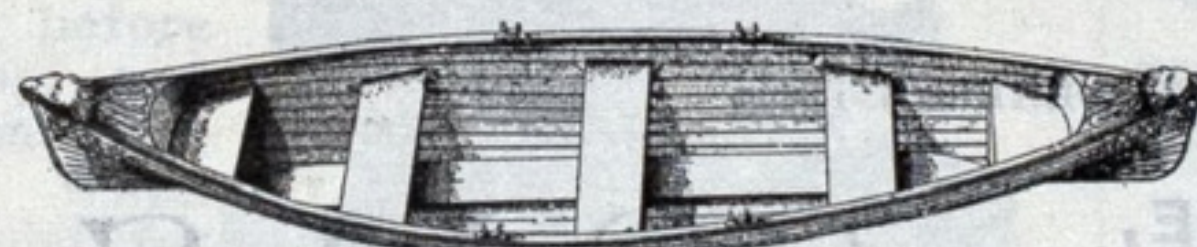
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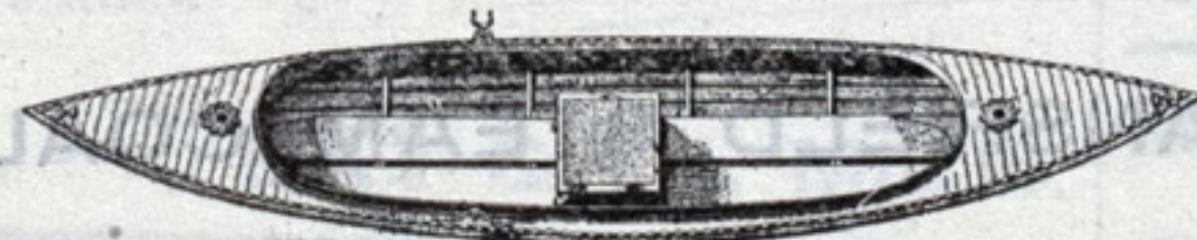
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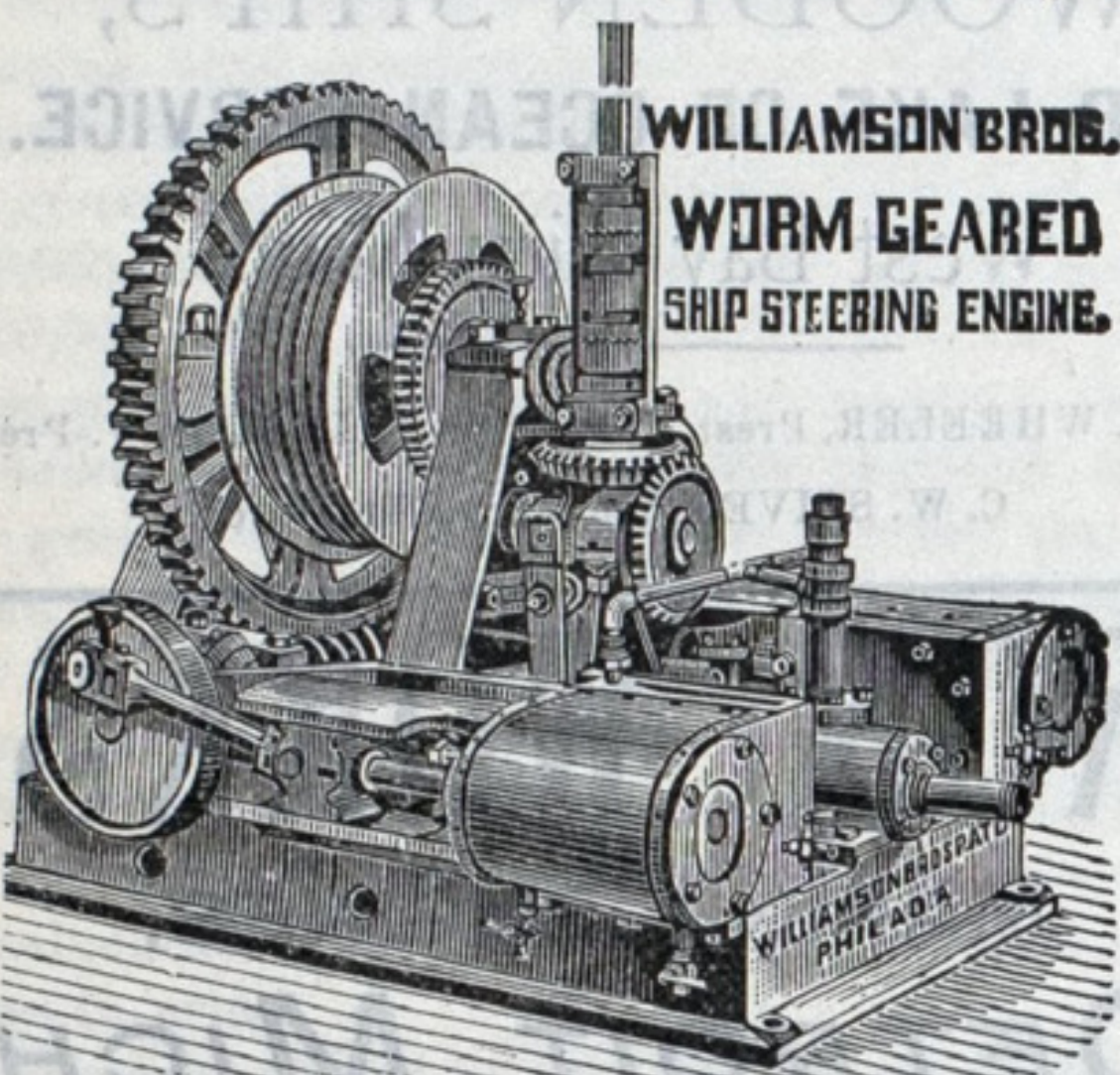


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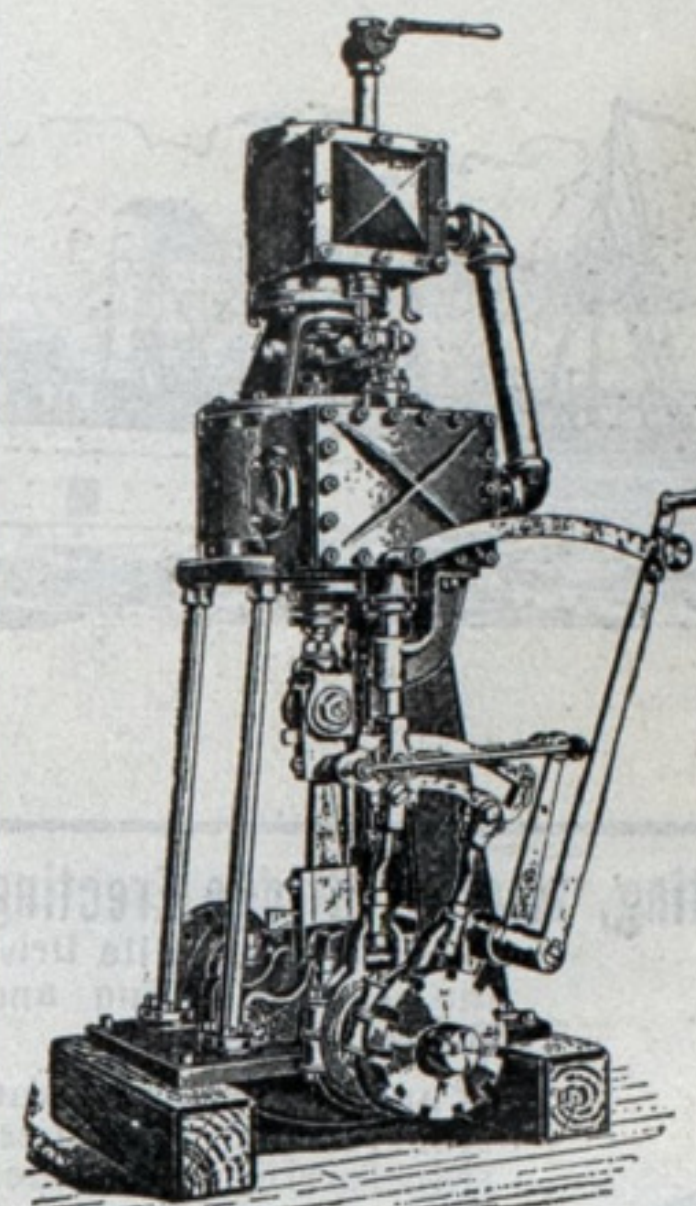
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SOME BOATS ARE BADLY HANDICAPPED FOR WANT OF THE RIGHT KIND OF

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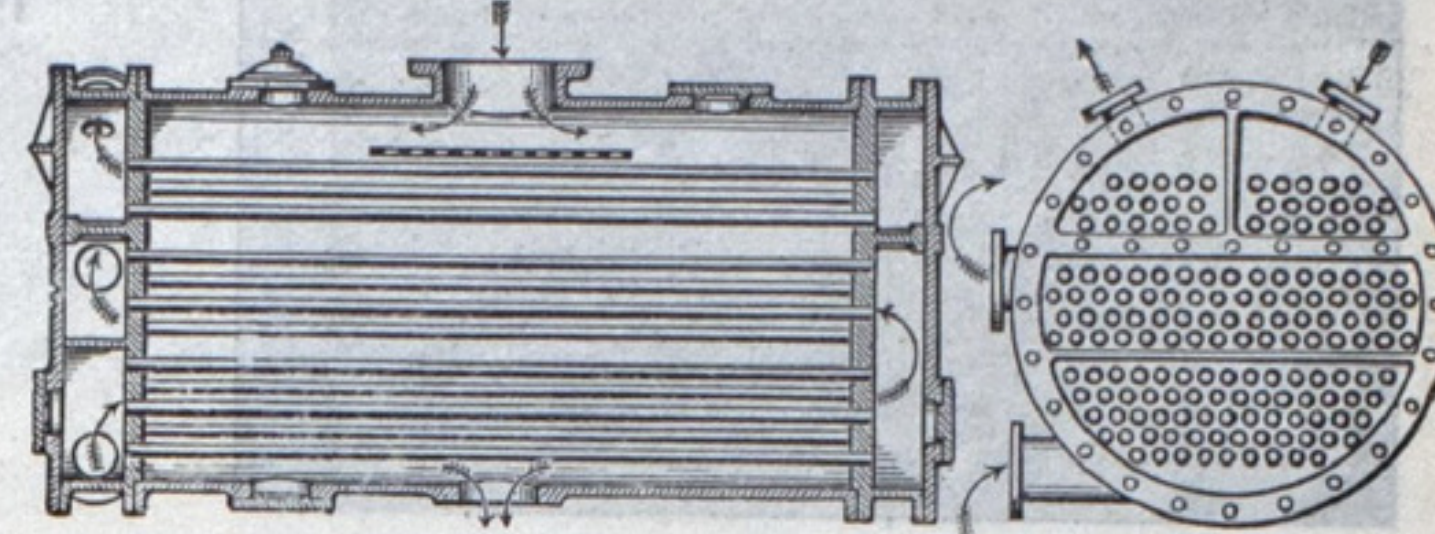
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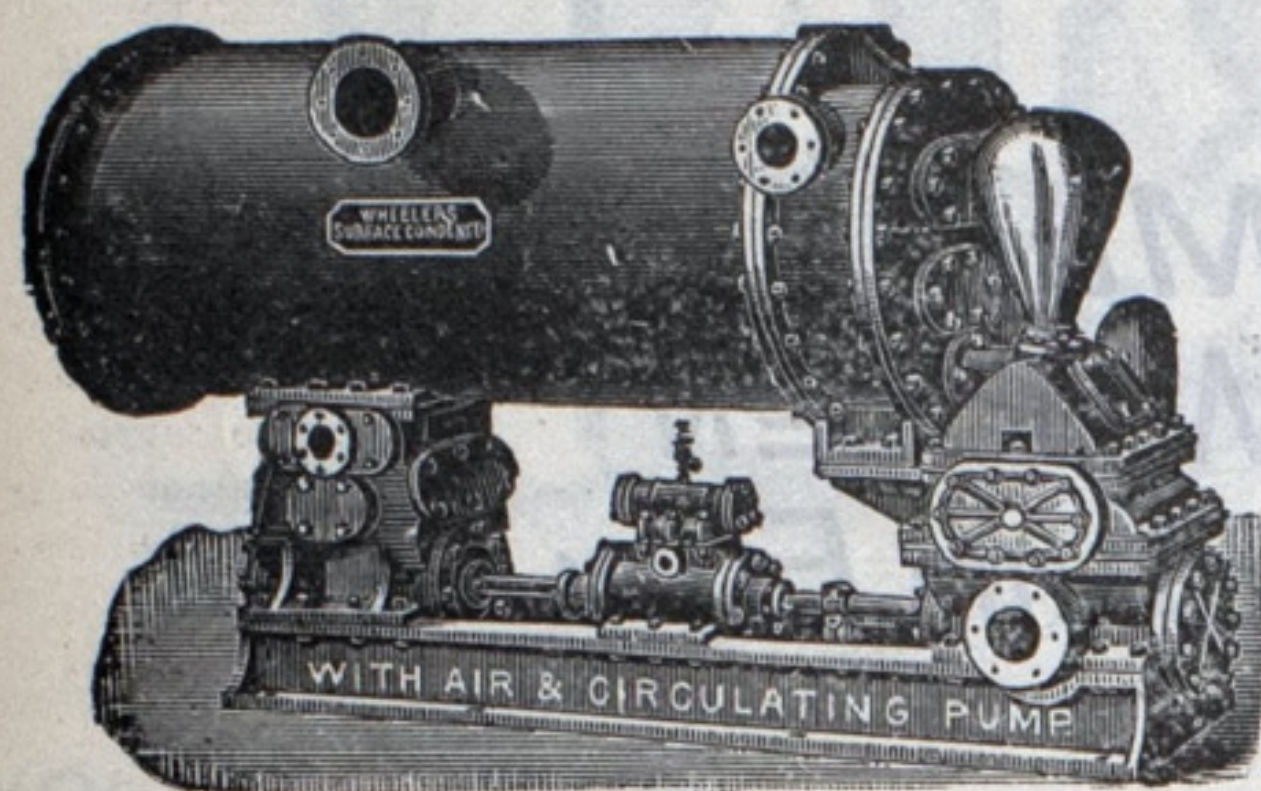
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NAME.	Boiler Inches.	Engine. H.P.	Over all ft.	Keel ft.	Beam ft.	Depth ft.
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Protection.....	15x79	22x20 90	77.4	15.8	8.9	
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D. T. Helm	14x72	20x20 80	66.8	15	7.6	
E. P. Ferry	12x72	18x20 73	58.6	15.5	8.4	
Black Ball No. 2....	12x72	18x20 75	60	15.6	8.6	
A. A. Carpenter ..	13x72	18x21 75	60.8	15.6	8.6	
Thomas Hood.....	13x72	18x21 75	59.5	15.6	8.6	
J. V. Taylor.....	13x72	18x21 75	60.8	15.6	8.6	
Satisfaction	12x72	18x20 73	58	15	8	
M. Shields.....	12x66	18x20 76	62	14.6	8.2	
Rebel.....	10, 6	16x18 66	54	14.6	7.8	
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I will be pleased to receive offers at once for any or all of above tugs.

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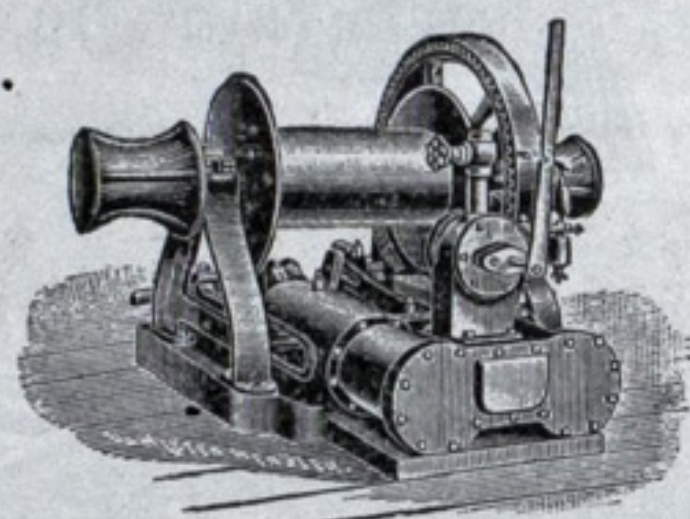
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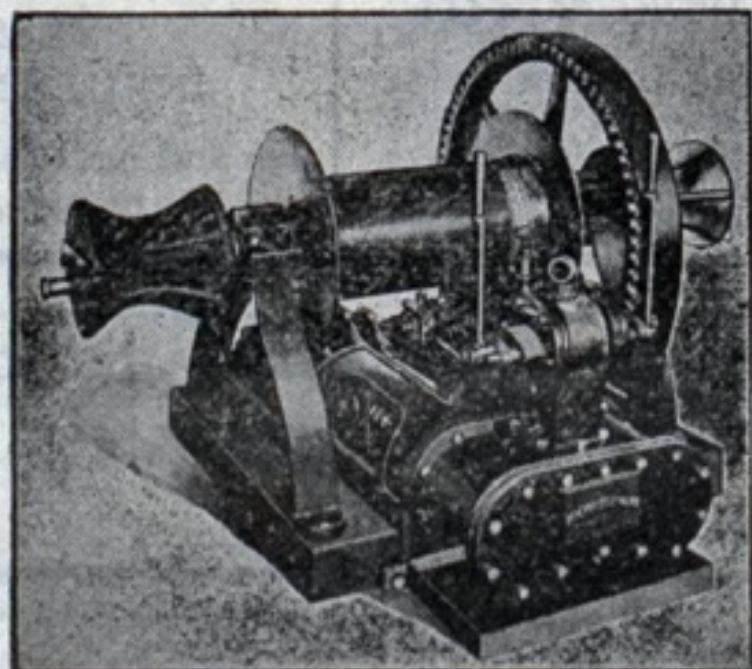
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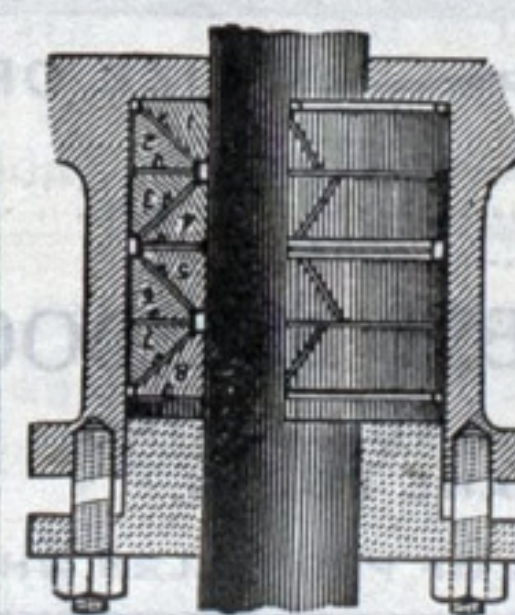
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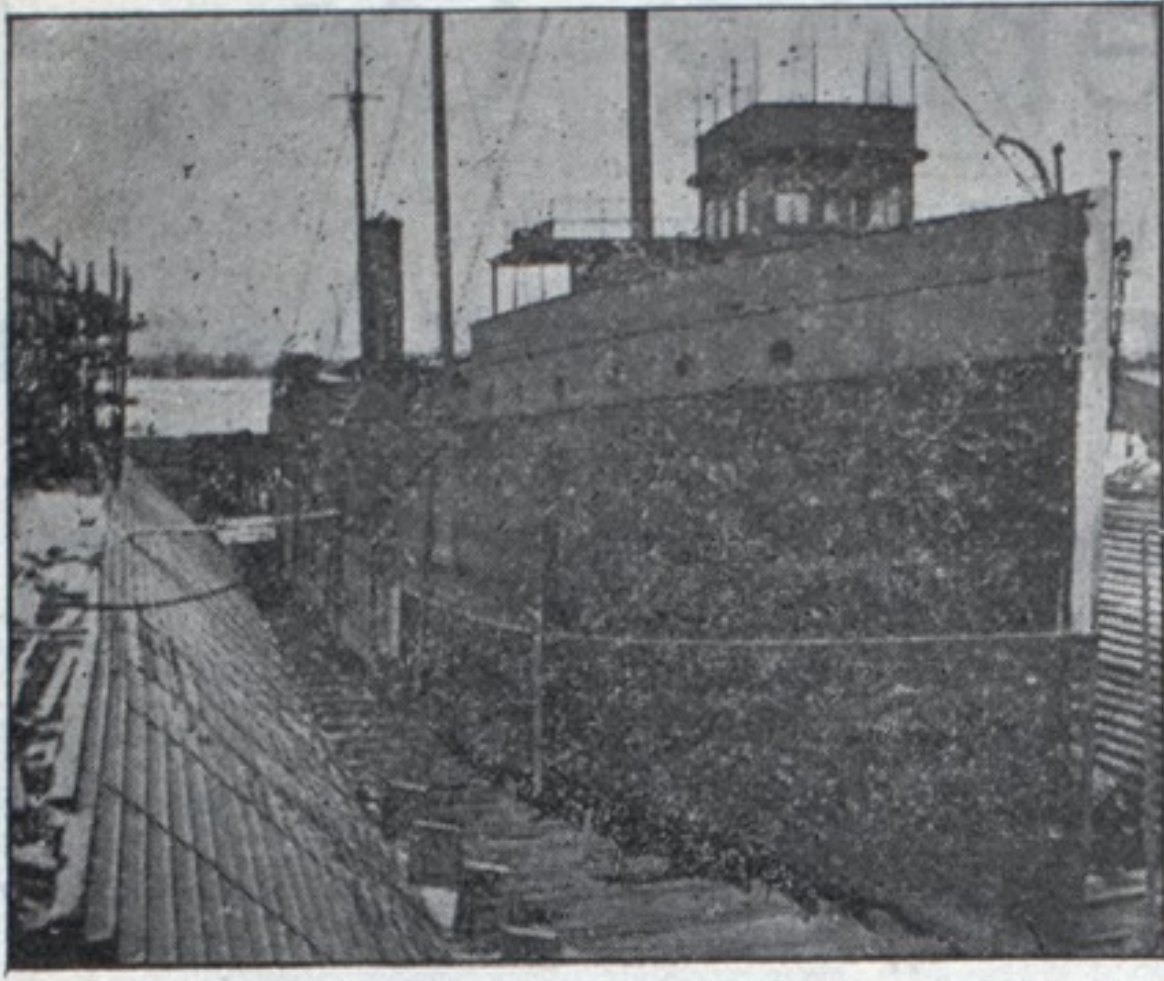
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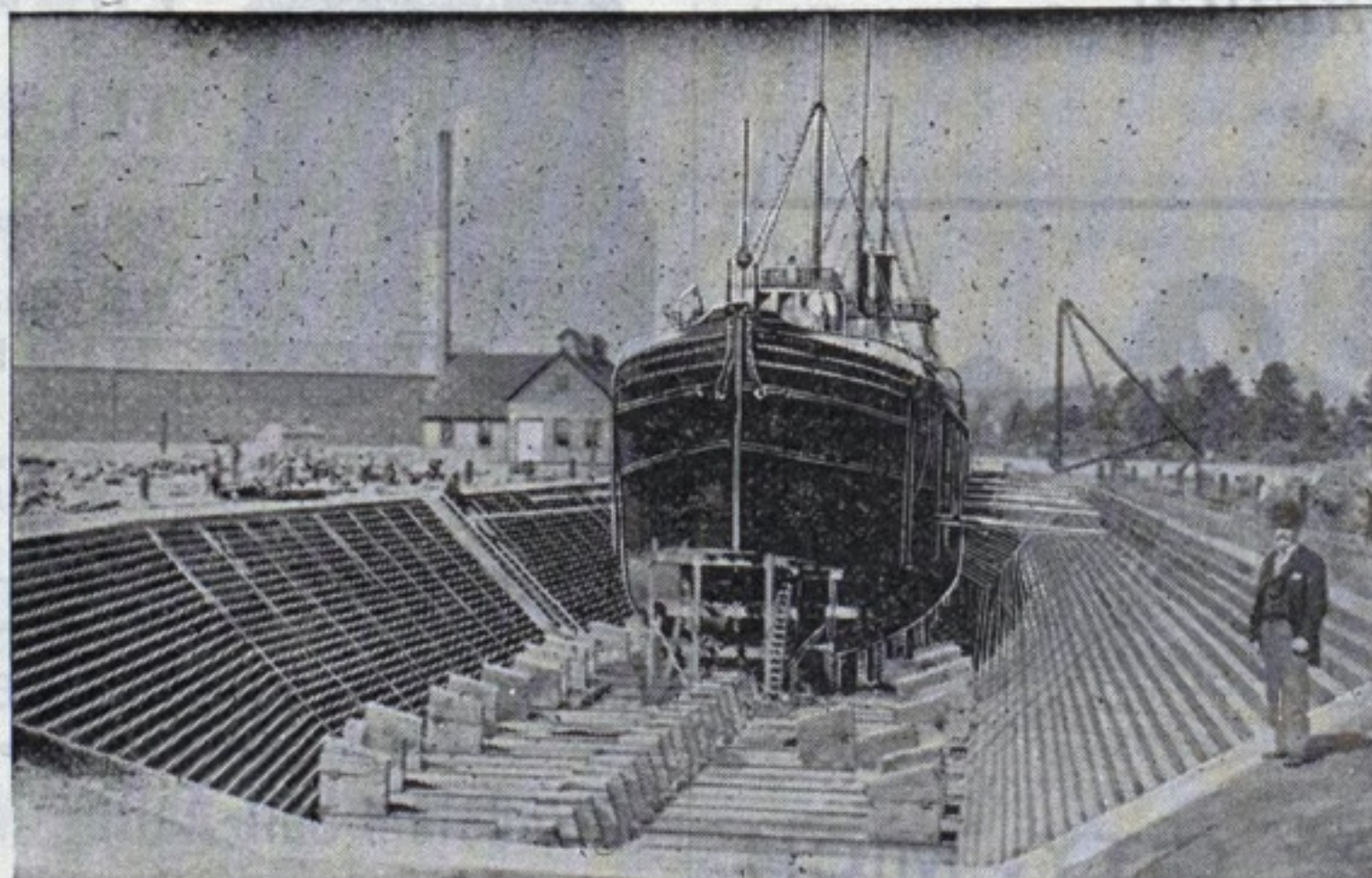
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Breadth, Bottom.....52 "	Depth over Sills.....18 "

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Nine feet water over sill.

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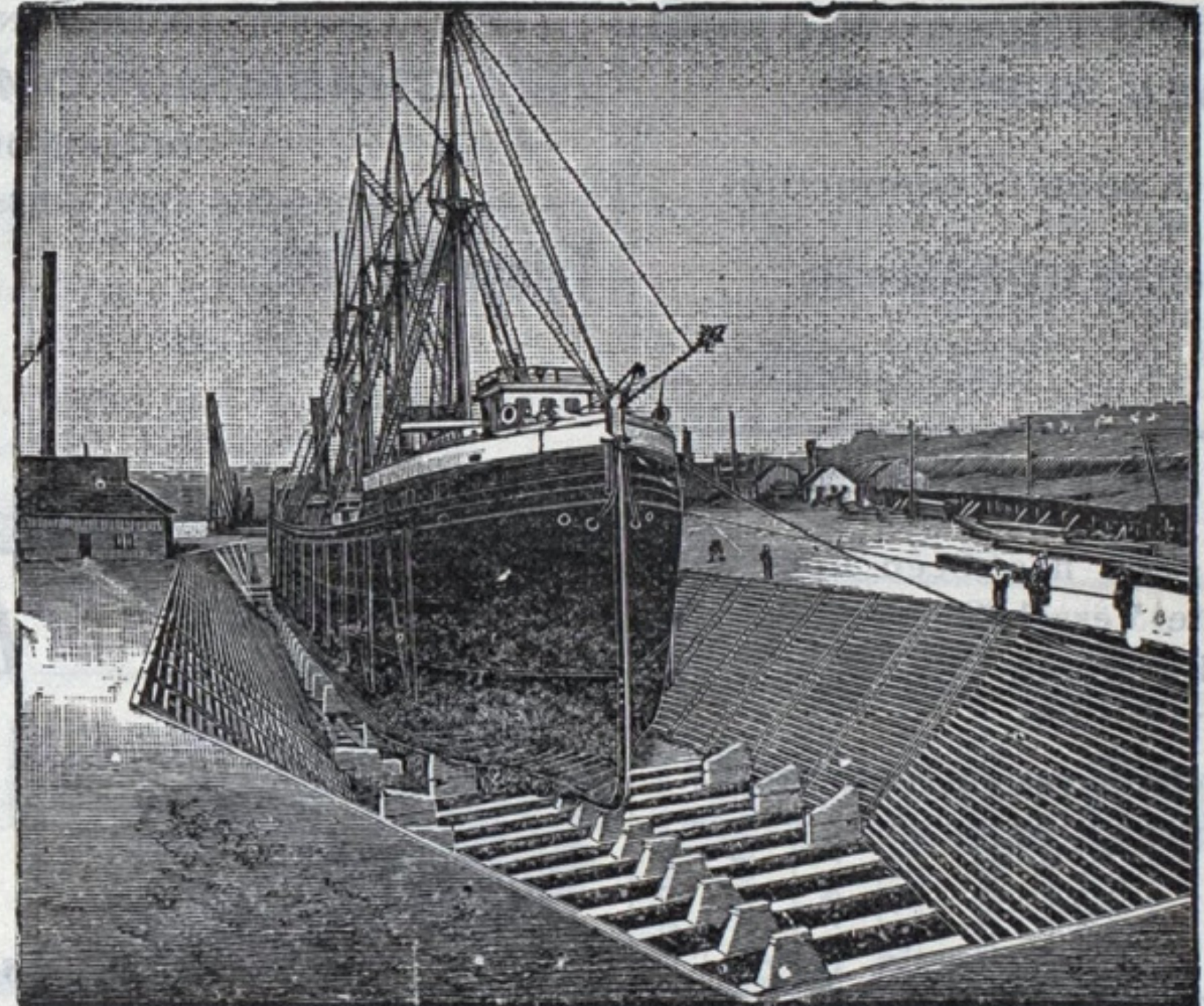
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